News of the Industry Begins Page 156

FEB 1 1926

# AUTOMOTIVE INDUSTRIES

Vol. 54
Number 4

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STS.
PHILADELPHIA, JANUARY 28, 1926

35c a copy
$3.00 a year

## Wheels are Great Stampings

Wheels like this are heavy stampings of intricate contour, requiring fine balance, absolute uniformity and perfect finish. On the completed part, in service, extreme responsibility rests.

Such great stampings are produced by the same Motor Wheel personnel and plant which can solve any stamping problem for you on a highly practical basis. Consult with a Motor Wheel man.

MOTOR WHEEL CORPORATION, LANSING, MICH.
*WOOD WHEELS . STEEL WHEELS . STAMPINGS*

## Motor Wheel Stampings


Entered as second-class matter Oct. 1, 1925, at the post office at Philadelphia, Pa., under the Act of March 3, 1879.

# Specialists In Motors

BECAUSE the Continental organization has spent 25 years in designing and building motors it has the knowledge of that field which makes for leadership.

Wide recognition of Continental Motors in the transportation field is due to the ability of the product to meet every demand even under severest conditions.

And these years of specialization are not only an assurance of quality and performance in every Continental Motor but they can be utilized to your distinct advantage in solving your own power problem.

CONTINENTAL MOTORS CORPORATION

*Offices*: Detroit, Mich., U. S. A.

*Factories*: Detroit and Muskegon

***The Largest Exclusive Motor Manufacturers in the World***

# Continental Motors

AUTOMOTIVE INDUSTRIES

VOLUME 54 *Philadelphia, Thursday, January 28, 1926* NUMBER 4

# *Production* and *Sales*— Will They Keep Step in 1926?

## Temptation unusually strong to "step" on production throttle but year's success depends largely on letting sales set pace.

***By Norman G. Shidle***

THE automotive industry enters 1926 with an estimated capacity for the production of something like 6,750,000 motor vehicles per year.

It is generally agreed that the maximum output likely is about 4,500,000.

That means that under favorable circumstances the industry as a whole will be operating this year at something like 65 per cent of capacity. If output for the coming twelve months totals only around 4,200,000—as some authorities predict, operations will be at about 62 per cent of capacity.

These figures point at least one definite conclusion:

*Prosperity and stability this year for both manufacturers and dealers rests almost entirely on the willingness of the factories to hold production in line with retail sales.*

Operations at 65 per cent of capacity are not to be considered as a sign of an unhealthy condition. No industry can expect to have all of its plants going full tilt except for brief periods during boom times. A good share of the increased capacity for production developed in the last twelve months, moreover, has been in the form of better methods, more efficient handling of materials and better arrangement of tools and other facilities. Only a part has involved additional investment in buildings and similar permanent items tending to increase overhead costs. The automobile industry with 65 per cent of its total capacity constantly in operation is likely to remain in a prosperous, profit-making condition as a whole.

Some companies, of course, will have a good bit higher percentage of their facilities in use, while others will not be so fortunate. And the fact might as well be recognized that the existing difference between probable output and potential capacity may bring competitive conditions which will work hardships on some of the weaker producing organizations. At the same time, past experience indicates that no two or three companies can keep going at capacity over any extended period of time while others of equal financial and merchandising strength have a multitude of idle tools.

### Tendency to Overestimate

A tendency has sometimes existed among the stronger automobile companies to overestimate the potency of their own sales and merchandising abilities and to underestimate that of their competitors. This is indicated by the fact that nearly every executive consulted in a recent survey predicted a fairly large production increase for his own company during 1926, but in no case did the executive who was so optimistic about his own prospects see any likelihood of the total output for the industry increasing more than a few hundred thousand over 1925, while many of them expect the total to fall slightly below last year.

If the optimism of every company's 1926 estimates should be justified, the total output this year would be somewhere in the neighborhood of 5,400,000 passenger cars alone. This figure is reached through correlation of the 1926 estimates of output made by executives of about 15 representative passenger car companies for their individual organizations. Admitting that nobody has the slightest expectation of a total car and truck production for 1926 of anything like 6,000,000, it becomes mathemat-

ically impossible for all of these individual estimates to be correct.

It is interesting to analyze more closely some of the recently announced plans. Despite an enormously successful and record-breaking year in 1925, far higher goals are being sought this year by a good many makers. One producer who increased his business last year by 50 per cent over 1923, expects 1926 to record a 400 per cent increase over 1925. One prominent concern which gained 10 per cent last year, hopes through introduction of a new model to show an 80 per cent upswing this year; another whose 1924 output exceeded that of 1923 by 120 per cent, hopes for a 250 per cent gain in 1926 over 1925. Two companies which last year did not come up to their 1923 mark, are aiming this year at 52 per cent and 315 per cent increases respectively over 1925 totals.

On the other hand, some of the most important and stable concerns in the industry are more conservative about 1926. One builder of high grade cars, whose success last year brought him a gain of 125 per cent over 1923, is planning an increase this year over 1925 of only 14 per cent; another, a quantity producer, who went up 36 per cent last year, expects about 15 per cent increase this year.

In reading and discussing published estimates of 1926 expectations, of course, it must be borne in mind that many of the factories which purport to see huge increases in business just ahead are not buying materials or hiring men or expanding their plants and organizations on the basis of these predictions. Their operations are going forward on a thoroughly conservative basis. They will be ready to supply any demand which may eventuate, but they are not conducting their activities on the basis of any Arabian Nights' dreams.

Despite the advantages of optimistic approach to the future, it is beginning to be recognized that too much enthusiasm over prospects has its dangers. Talking big has a subconscious, if not a direct, effect on the mind which finally tends to result in actions not in accord with sound practice. Optimism has a tendency to pyramid. The Bingo Company figures that it can increase its output this year by 25 per cent; then the Bungo outfit, feeling itself to be better in many ways than its rival, immediately says, "If those fellows can kick up their schedules 25 per cent, we can safely jump ours 50 per cent." Then a third company bases its estimates on what the Bungo Company has planned and so on *ad infinitum*.

The automotive industry is prone to talk optimistically and to feel optimistic. It is that ability to go forward with confidence and to do big things in a big way that has made possible the development of the motor vehicle and the industry behind it to its present size and success. It will be a sad day for automotive progress if that spirit of optimism and youth ever leaves the powers behind the industry.

But in addition to optimistic approach to problems, a spirit of over-enthusiasm occasionally has crept into operations as well. The results in 1921 and in 1924 were not favorable.

Nor can this attitude properly be based on the idea that all of the business is rapidly going to be concentrated in the hands of a few companies. A trend in this direction has been going ahead for some years, it is true, but the trend hasn't been nearly so rapid as general conversation would indicate.

Back in 1914 the ten leading producers built about 84 per cent of the total passenger car output, ten years later, in 1924, the ten leading producers built 87 per cent

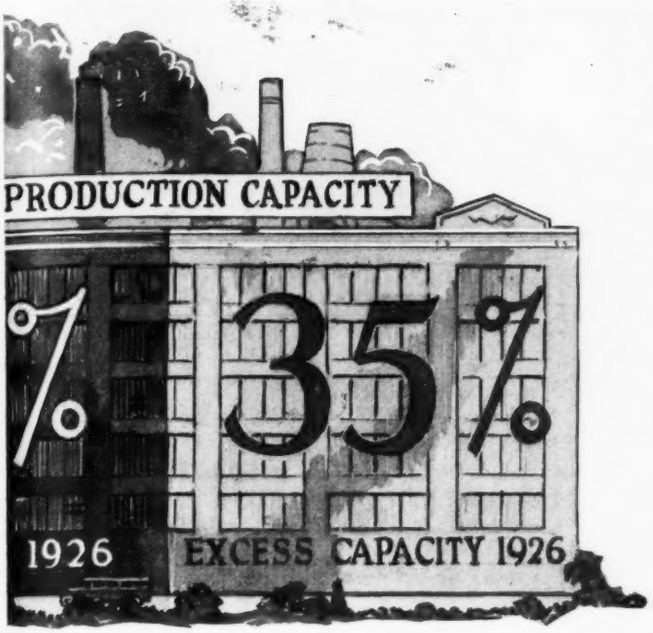
## Ten Largest Passenger Car Producers

**THIS table shows the companies which were the ten largest producers in each of the last 10 years.**

**Seven companies appear in the list every year. These are Ford, Willys-Overland, Chevrolet, Maxwell - Chalmers - Chrysler, Studebaker, Buick and Dodge companies.**

**Seven other companies complete the total names which appear in the list. These are Saxon, which appeared among the first ten only in 1916, Reo, Oldsmobile, Oakland, Nash, which came in in 1916 and has remained ever**

| 1916 | 1917 | 1918 | 1919 | 1920 |
|---|---|---|---|---|
| Buick | Buick | Buick | Buick | Buick |
| Chevrolet | Chevrolet | Chevrolet | Chevrolet | Chevrolet |
| Dodge | Dodge | Dodge | Dodge | Dodge |
| Ford | Ford | Ford | Ford | Ford |
| Maxwell | Maxwell-Chalmers | Hudson | Hudson-Essex | Hudson-Essex |
| Oakland | Oakland | Maxwell-Chalmers | Maxwell-Chalmers | Maxwell-Chalmers |
| Reo | Oldsmobile | Oakland | Oakland | Nash |
| Saxon | Reo | Oldsmobile | Oldsmobile | Oakland |
| Studebaker | Studebaker | Studebaker | Studebaker | Studebaker |
| Willys-Overland | Willys-Overland | Willys-Overland | Willys-Overland | Willys-Overland |




*THIS picture gives a graphic comparison of the production capacity that is likely to be utilized by the automotive industry in 1926 and the capacity which will remain over and above requirements. Any industry which operates as a whole at 65 per cent capacity, however, is in a very healthy state.*

of the total passenger car output. A good many of those who were in the first ten in 1914 still were there in 1924, but several new and prominent names appeared in the latter list. Last year the ten leaders made 87.5 per cent of all the cars built.

Thus it appears that competitive factors are likely to weigh heavily with the leading as well as with the smaller producers, particularly in view of the fact that it is the bigger units of the industry which are so keyed up as to necessitate a very close relationship between quantity and profits.

Typical of the more conservative views of the situation are the recent public expressions of Roy D. Chapin and A. R. Erskine. "We will be satisfied if 1926 is as good as 1925," Mr. Chapin said as toastmaster at the N. A. C. C. banquet in New York, "but we are going to try to make 1926 better if possible."

Speaking of the prospects of his own company, Mr. Erskine is quoted as saying: "From present indications earnings for the first quarter of 1926 will run considerably ahead of those of the 1925 period. We expect to have a good first half and hope to have a good last half. I see no cloud on the business horizon for the first half of the year and expect progress generally throughout the country."

With the country generally prosperous there is no need to worry about 1926 so far as automotive manufacturers are concerned so long as the lessons of two years ago are kept in mind and cars are built only in such quantities as can readily be absorbed by the retail market. With capacity exceeding probable consumption by 35 per cent, the danger of overproduction exists, obviously, but so strong an inclination is present among important factories to keep dealer stocks normal that it is hardly conceivable that major difficulties will arise.

Most factories are planning to give careful attention to this phase of their activities in the next three months, feeling that stable conditions will be assured for some time if this danger period can be passed without overproduction. Several leading executives have pointed out informally, however, in recent conversations that a real need for care exists. One of them, who is in close touch both with factory and field conditions, reasons this way:

"The country generally is prosperous. Consequently, automobile manufacturers quite properly are looking for good Spring business, particularly in view of the excellent buying which took place at the New York Show.

"With this good Spring business in sight, they are going to urge their retail organizations to stock sufficient cars to take care of it—again quite properly.

"But the danger lies in the possibility of overestimating the amount of Spring buying, despite the fact that it is certain to be relatively good. The ability to produce which exists will tend to make the factories view the probable size of Spring business as favorably as possible. The wish may be father to the estimate.

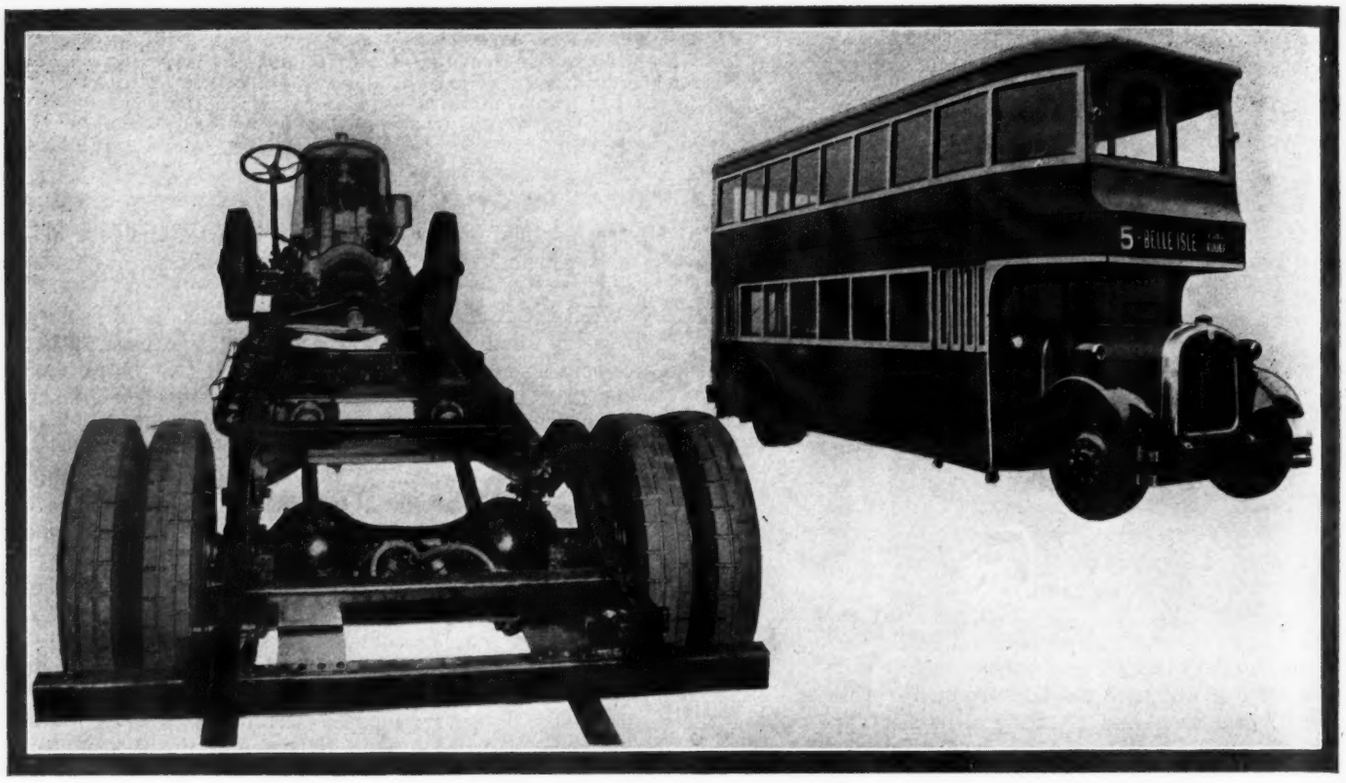
"The factory economists are a much maligned lot, but chief executives right now should give ear to their rather cold-blooded analysis, at least as much as to the more enthusiastic opinions of the sales department."

# for Each Year from 1916 to 1925

**since, Hudson, which entered the group in 1918 and has remained, and Star-Durant, which entered the first ten in 1922 and has remained up to the present.**

**In 1914 the ten largest producers built 84 per cent of the total output; in 1925 the ten largest built 87.5 per cent of the total. Thus it appears that the trend toward concentration of business in the hands of a few makers is not progressing as rapidly as might be indicated by general conversation. The small manufacturer is managing to hold his own.**

| 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|
| Buick | Buick | Buick | Buick | Buick |
| Chevrolet | Chevrolet | Chevrolet | Chevrolet | Chevrolet |
| Dodge | Dodge | Dodge | Chrysler | Chrysler |
| Ford | Durant-Star | Durant-Star | Dodge | Dodge |
| Hudson | Ford | Ford | Durant-Star | Durant-Star |
| Maxwell-Chalmers | Hudson-Essex | Hudson-Essex | Ford | Ford |
| Nash | Maxwell-Chalmers | Maxwell-Chalmers | Hudson-Essex | Hudson-Essex |
| Oldsmobile | Nash | Nash | Nash | Nash |
| Studebaker | Studebaker | Studebaker | Studebaker | Studebaker |
| Willys-Overland | Willys-Overland | Willys-Overland | Willys-Overland | Willys-Overland |




*These views show the chassis and the body design of Graham Brothers new gas-electric, double-deck bus*

# Graham Brothers Enter Heavy Bus Field With Single and Double-Decker

**Double-deck design has gas-electric drive with General Electric and Continental units. Conventional drive used on smaller model.**

TWO new buses have been introduced by Graham Brothers. The first of these is a 60-passenger, fully enclosed metropolitan type driven by the gas-electric system. Being fitted with Westinghouse air brakes and provided with an automatic rear door inter-connected with the braking system, the bus can be operated either as a one-man or a two-man type, depending on traffic conditions.

The second new bus is a single deck, street-car type, with single front and emergency rear door, and with seating accommodations for 29 passengers. In this bus the regular four-speed mechanical transmission is used. Both jobs are mounted on pneumatic tires all around, with duals on the rear wheels. Budd disk wheels are used all around. Both buses have Continental six-cylinder engines and Timken worm-driven rear axle is fitted on the larger, electrically-driven machine, each rear wheel being driven by a separate electric motor.

A noteworthy feature of the larger bus is the body design. The driver is seated on the lower deck in the main compartment, and the stairs to the upper deck are located along the rear wall. An aisle extends centrally the full length of the bus and divides several sets of two-passenger lateral seats. Over the wheel houses are placed longitudinal seats for three passengers, and another is located opposite the driver's seat immediately back of the front door. The ceiling or roof is of the monitor type, with 74 in. head room over the aisle but considerably less over the seats.

This arrangement allows the seats on the upper deck to be placed back to back along the center line of the body. Each seat of this row on the upper deck has an individual back, which eliminates the unpleasant swaying back and forth which would otherwise occur. Three seats at the front of the rear deck face forward, and three auxiliary seats in excess of the rated capacity are placed in the corners, the fourth corner being taken up by the upper end of the stairway. This bus is rated to carry 28 passengers on the lower deck and 32 above.

Steel sash windows, which can be lowered flush with the sills, completely enclose both decks. Ventilator channels, which are placed between the backs of the upper seats, convey heat from the lower to the upper deck, the former being exhaust-heated. Circulation of fresh air is insured by an indirect ventilator which is installed in the front wall of the monitor just above the windshield and ventilators placed in the roof of the upper compartment. Another unusual feature is the lighting of the interior. Lamps are

placed back of sanded glass diffusers in the sides of the monitor, and, in conjunction with a white-enameled ceiling, they flood the lower deck with indirect illumination. The upper deck has similar lamps set in the roof.

Both doors are at the right side, and their bottoms are just above the height of the ordinary curb. Each of these doors is opened and closed by air pressure drawn from the storage tanks of the air brake system, and the valves are interconnected with the service or air brakes, so that the bus can not be moved until the doors are closed. This, however, does not apply when two-man operation with a conductor at the rear is necessary; in that case the inspector or starter unlocks the control of the rear door with his key, to permit manual operation by the man at the rear. When one man is in charge of the bus control of the rear door is made automatic by a hinged section of the platform just inside of the door. As the bus draws near the stop, the weight of the passenger standing at the door causes the platform to depress and control the door opening. The door remains open for six seconds after the passenger alights and the brakes are locked for that period. If another descending passenger approaches the door as it starts to close, automatic opening occurs again and the brakes are reset. Front door control is by a separate valve.

### Four-Wheel Air Brakes

A heavy, well-braced pressed steel frame, which has a kick-up at each axle, is the foundation of the entire bus. While the left side member extends clear to the rear of the bus, the right is cut off just back of the rear axle and supplanted by a sub-frame which permits of the low platform height at the rear door. Both front and rear axles are made by Timken, and brakes operated by the Westinghouse system are mounted at all four wheels. A parking brake is controlled by a long hand lever at the right of the operator, and additional braking action is provided by the General Electric System. The controller at the left of the operator can be set readily for forward and reverse driving, electric braking and neutral.

While the front axle is the conventional wide-tread Timken bus axle, the rear axle is the special type incorporating a separate under-mounted worm drive for each wheel. The electric motors are placed immediately back of the middle of the body and inside of the frame side members. Tubular propellor shafts and Spicer enclosed joints transmit the power to the individual worm drives. Tires are 36 x 8 in. all around. Auxiliary springs are fitted to the rear axle.

Power is derived from a Continental model 14-U engine, which is directly connected to the generator of the General Electric transmission system. Bore and stroke of the engine are 4½ in. and 5¾ in., respectively, and the maximum output exceeds 100 hp. Every feature of the engine is designed with a view toward meeting the exacting demands of bus service. Seven large main bearings carry the crankshaft and lubrication is by full pressure system. A Staynew filter is placed ahead of the Zenith carburetor and the electrical system is Northeast.

### Wheelbase of Big Bus 234 In.

The wheelbase of the double deck bus is 234 in. and bumpers are fitted at both front and rear. Steering is by a Ross cam and lever gear. The gas tank, of 41 gal. capacity, is placed just back of the front door, and the filler and gage are located in a recess in the side of the body. At the rear the license bracket is accomodated in a similar recess, so that none of these parts is subject to collision. Road illumination is secured by Edmunds and Jones head lamps which are mounted atop the full crowned steel front fenders.

While the wheelbase of the lighter, 29-passenger single deck bus does not vary greatly from that of the larger job, the tires on this model are 36 x 6 in. all around, with duals at the rear. Westinghouse air braking is utilized on this model as well, but only at the rear wheels. This body is fitted with the dome roof which is characteristic of single deck buses, and the seating arrangement is approximately conventional, with the aisle at the center, several rows of cross seats, a full seat at the rear end, and longitudinal seats over the wheel houses. The middle portion of the seat across the rear of the body is hinged and mounted on the emergency door. The front door is controlled by a hand lever adjacent to the steering wheel.

One of the unusual features of the smaller chassis is the frame construction. The side members are the usual heavy deep channels with spring horns at the front and a kick-up over the rear axle. These are tied together by six channel cross members, all gusseted. The rear engine support takes the form of a steel plate extending inward from each side of the frame, with a formed surface which follows the joint between the engine and gear box at the bell housing. Large diameter steel tubes, welded to each of these plates, extend backward through the next three cross members and are welded again to the last of these. This arrangement is intended to decrease frame weave and thus to eliminate many of the body troubles experienced when long chassis are used.

The power plant in the single deck bus is a smaller edition of that of the larger job, being a Continental model 7-T six cylinder engine of 4⅛ in. bore and 5¼ in. stroke. Electrical and other equipment is similar to that on the larger job. Both axles are made by Timken, and the rear is worm driven. The propeller shaft is joined at the middle cross member. A conventional clutch and a four-speed and reverse gear set take the place of the electric system on the double deck bus.

Steering is by the Ross gear, and Edmunds and Jones headlamps are carried in the same manner as on the larger job. The gas tank is mounted at the rear of the frame, and, as on the larger job, a bus-size Stewart Warner vacuum tank supplies the engine. A Bosch two-tone horn is fitted on both buses. A large cast aluminum radiator shell embodies typical Dodge and Graham features of design.

---

A NEW form of vibration dampener has been patented by the Austrian Daimler Co. (British patent 217,928). The crankshaft of the engine drives the driven shaft (transmission shaft) through a multiple disk clutch, and the outer member of this clutch is formed with a conical surface on its outside, which supports the flywheel, the latter having an enlarged hub which is bored out to a taper to fit the cone on the disk clutch. The same spring which holds the disk clutch in engagement also presses the flywheel hub against the cone on the disk clutch.

---

## Volume 53 Index Now Ready

**THE index for Volume 53 of *Automotive Industries*, including issues from July 2 to December 31, 1925, is now ready for distribution. A copy will be furnished gratis to subscribers who request it. Those who have received previous indexes will be supplied with a copy of the new one automatically and need not make a special request for it.**

# New Methods of Body Construction Eliminate "Blind Spots"

*Use of all-steel body pillars and door frame members above the belt line results in greater area of glass enclosure and increase in range of driver's vision.*

By K. W. Stillman

ONE of the recognized disadvantages of closed cars has been the wide body pillars considered necessary for that type of body and which cause "blind spots" for passengers in the car. Besides the inconvenience of these blind spots, they are dangerous when they limit the driver's field of vision. During the past year considerable progress has been made toward reducing the size of body pillars with the result that there are several types of construction now available for closed cars in which blind spots have been practically eliminated.

To remove all danger from blind spots it is only necessary to keep the width of upper frame members within 2½ in., since this is about the distance between a man's eyes. When pillars are wider than this the area which is invisible from the driver's position increases in width with distance from the car so that at a distance of 125 ft. a car approaching from the right might be invisible to the driver, while one approaching from the left might come as close as 50 ft. before being seen.

### Very Small Invisible Area

When the pillars are no wider than the distance between a man's eyes the invisible area is at no time wider than the pillar and for all practical purposes there is no blind spot. Fig. 1 shows this effect of narrow pillars on the range of vision.

Wide body pillars were an integral part of composite closed body construction because it was believed that in order to gain the necessary strength for this type of body considerable material was necessary, especially at the windshield supports which included front door hinges or locks with that function.

It was natural, then, that when steel bodies were introduced it became possible immediately to reduce the size of the pillars, since steel pillars of sufficient strength could be made of much smaller cross section than with composite construction.

As exemplified by all steel bodies made by Edward G. Budd Mfg. Co., this type of construction permits much greater economy in driver vision. The difference between this construction and standard composite construction is strikingly illustrated in Fig. 2, an illustration furnished by Budd, in which sections of steel and of composite door and window frames are super-imposed. Although it is not so stated it is presumed that the respective sections apply to bodies of the same outside dimensions and designed for the same chassis.

The gain in glass-enclosed area starts with the windshield, which is approximately 2 in. wider in the all-steel than in the composite body. While the width of the pillars themselves is substantially the same and even slightly greater in the all-steel body, a great gain is made by the change of the door frame from the composite to the steel construction. In the composite body the door derives its strength or rigidity from the wood frame, and in order to obtain secure joints the door frame members must be made comparatively wide. Moreover, the door is entirely between body pillars.

With the all-steel body, a door frame of Z section is used, and this section when the door is closed lies in a recess of the pillar, hence the effective width of the door glass is substantially equal to the effective width of the door opening. This applies to both the front and the rear doors. A further gain in the angle of vision through the door glass results from the fact that the width of the door at the inside edge of the glass channel in the all-steel body is very

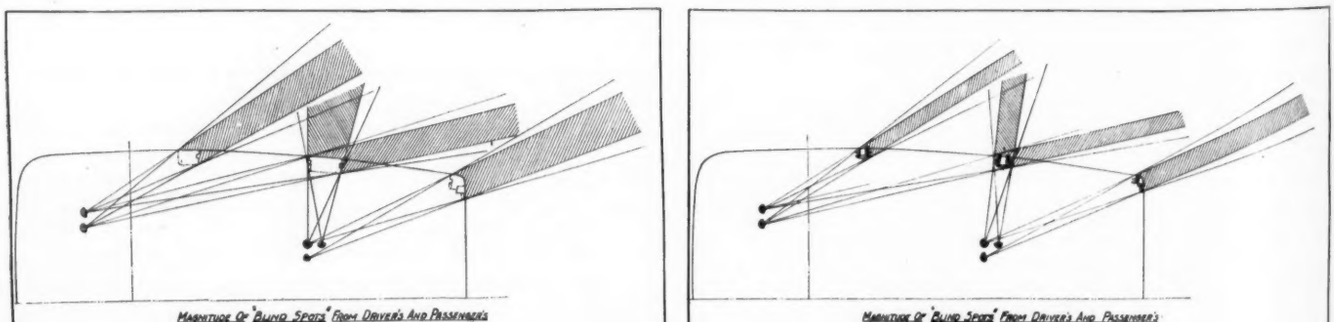

MAGNITUDE OF "BLIND SPOTS" FROM DRIVER'S AND PASSENGER'S POSITIONS IN A "STANDARD COMPOSITE SEDAN BODY"
EDW. G. BUDD MFG. CO. PHILADELPHIA, PA.
MAGNITUDE OF "BLIND SPOTS" FROM DRIVER'S AND PASSENGER'S POSITIONS IN A "BUDD ALL STEEL FULL VISION SEDAN BODY"
EDW. G. BUDD MFG. CO. PHILADELPHIA, PA.

*Fig. 1. Charts showing comparative magnitudes of blind spots from driver's and passenger's positions in bodies with wide and narrow body pillars*

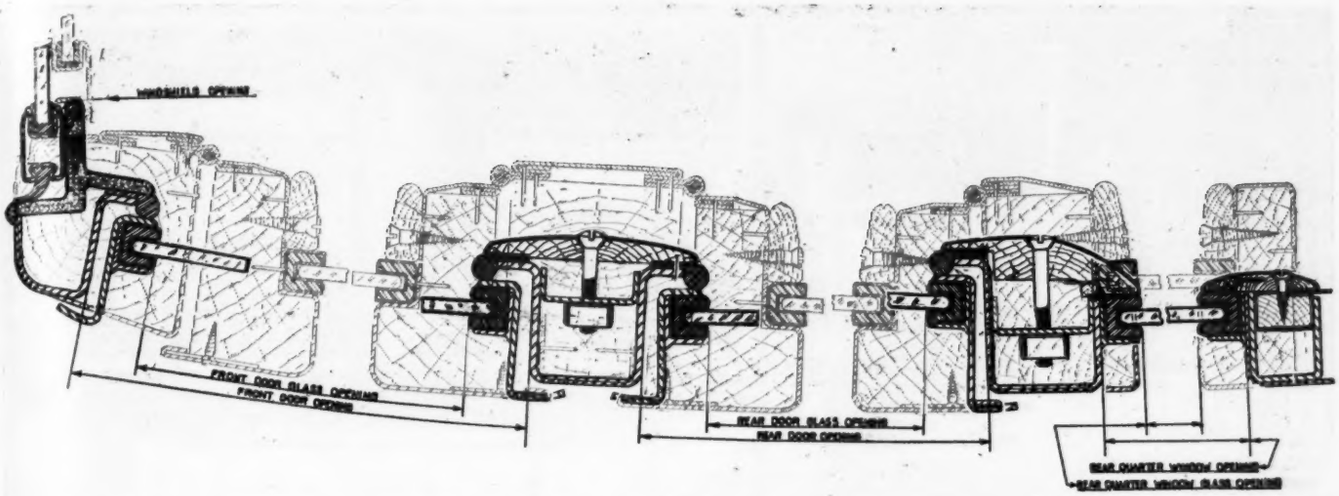


*Fig. 2. Graphic comparison of size of Budd all-steel body pillars with those of ordinary composite construction*

little greater than the width of the channel itself, while in the composite body the former width is more than four times as great as the latter. While the total width of the steel door is not so very much less than the wood frame door, that portion of the width of the door from the glass channel outward lies farther back, as it were, and hence does not intercept rays of light striking the glass at an angle up to 30 deg.

Other builders who specialize in composite bodies have recognized the need for reducing the blind spot and have adopted all-steel construction for that part of their body pillars which is above the body line in successful attempts to secure the same results that are more or less inherent in all-steel construction.

In the Franklin closed bodies, for example, the frames for door and window glasses are steel channels just wide enough to permit the glass to slide in them. These frames are elongated so that they contain the glass in all positions of its vertical adjustments. This construction is shown in Fig. 3. The forward and rear standing pillars are tubular and are recessed for the door, and the forward pillar is recessed for the windshield which is secured in a channel frame similar to that used for the windows.

In Fig. 4 the construction at the windshield is shown with the door closed. It is evident that although considerable metal is required to contain the window and the windshield and to function as a body pillar, by recessing the pillar in the manner shown this excess metal does not increase the effective width of the whole construction beyond the maximum of 2½ in. necessary to secure clear vision.

Not only does this type of construction eliminate blind spots but it is also claimed to facilitate assembling operations, particularly those of door framing and paneling, glass and regulator installation, door hanging and windshield installation. Patent applications are pending on several features of this type of construction which has been developed by W. H. Edmonds, head of the Franklin body engineering department.

Brewster & Co. have accomplished the same purpose in narrowing pillars of their closed bodies to an extent which practically eliminates blind spots. The upper right section of Fig. 5 gives an excellent illustration of the benefits from narrow pillars. The two views were taken from the same location approximately the position of the driver's eyes. With the usual wide pillars the man standing only three feet from the right front wheel had to stick out his elbows in order to get in the picture at all while the car coming in from a side road at a distance of 80 ft. is practically invisible. Travelling at a speed of 30 miles per hour the driver is only two seconds away from the other car but he can't see it yet. In the other part of the illustration the same conditions are shown with the Brewster clear vision construction. The remarkable increase in vision is clearly evident.

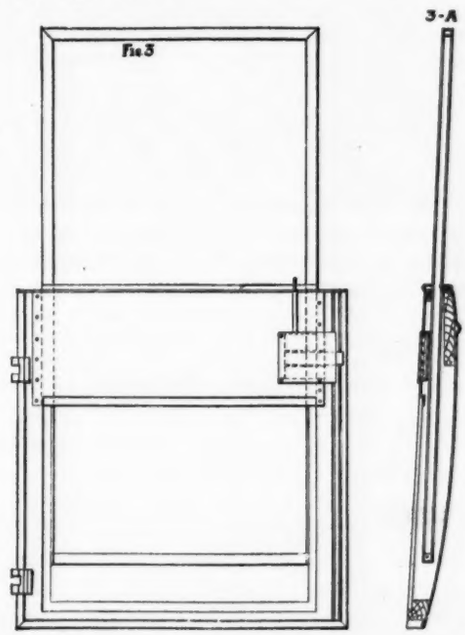



*Fig. 3. Complete door, minus glass and regulator, made by combining all-steel upper unit with the composite lower unit in Franklin bodies.*

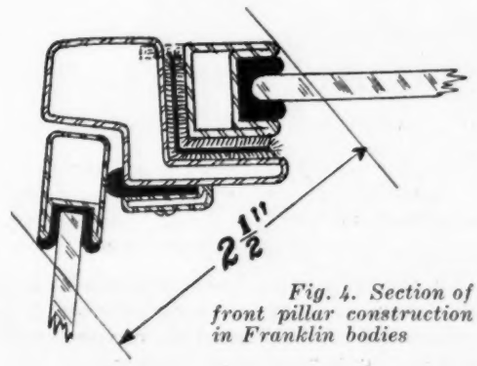



*Fig. 4. Section of front pillar construction in Franklin bodies*

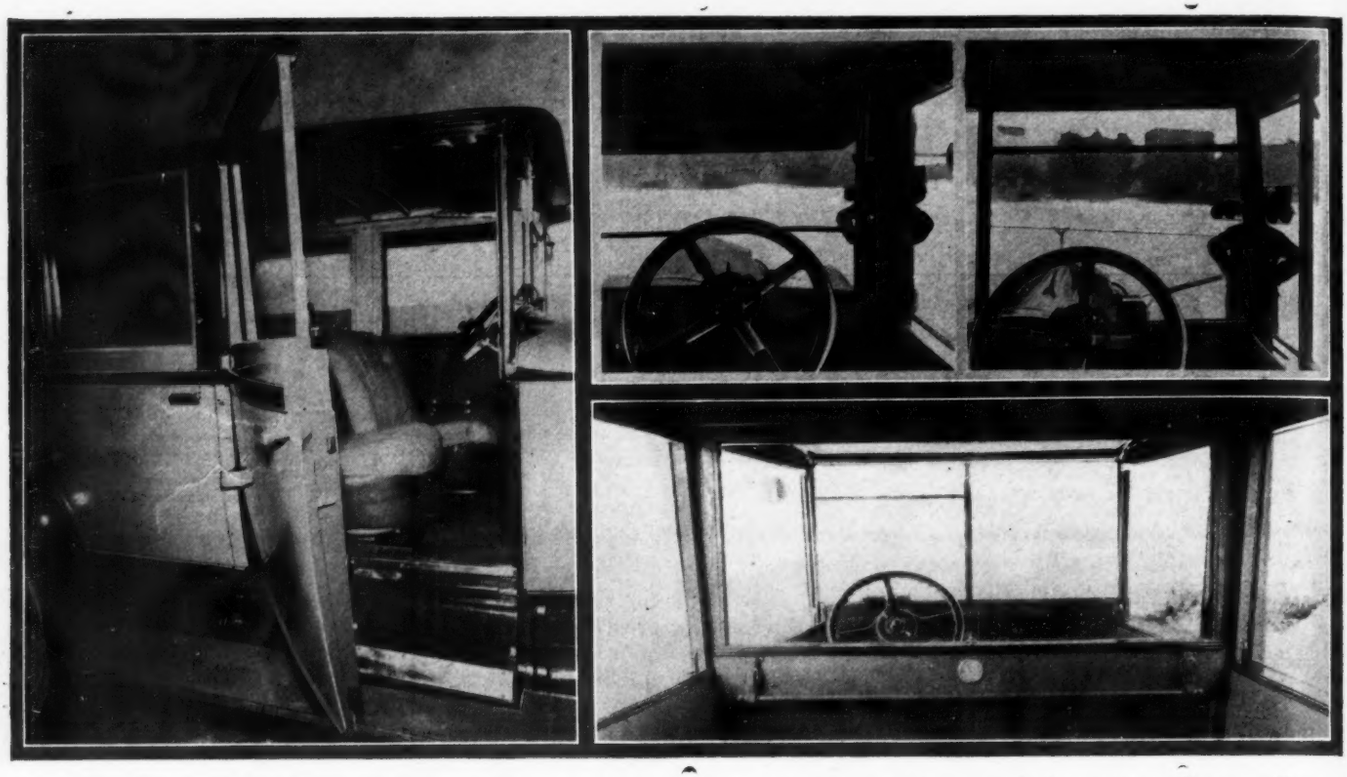


*Fig. 5, Upper right: Comparison of extent of driver's vision in Brewster bodies and bodies with ordinary pillar construction. Left: Detail view of Brewster door and windshield to show method of construction. Lower right: View from interior of Brewster closed body showing narrow front pillars and vertically divided windshield*

Construction of the door is shown in the left-hand view. The upright pillar after it leaves the door framing is a steel channel just large enough to hold the felt in which the glass runs and actually is 7/8 by 5/8 in. This channel runs from the top down to the bottom of the door so that it serves to strengthen the entire structure as well as provide clear vision. To accomplish this the framing of the door itself contains the lock and is located underneath the windshield.

### The Brewster Windshield

At the lower right is shown the Brewster windshield as viewed from the rear seat and shows, incidentally, the divided construction used, with only the part in front of the driver adjustable. In this view, a comparison of the width of the front pillars with that of the center pillars emphasizes the great improvement the latter are over earlier constructions.

At the New York Show this year a considerable number of cars were exhibited in which full vision, for the driver at least, had been secured. In nearly every case the employment of steel posts at the windshield supports and for the front door frame was the method used to obtain clear vision although the detail designs showed some variation.

Auburn and duPont were noticed to have Brewster type construction similar to that already described. Jordan eights, equipped with Budd all-steel bodies, have clear vision for both front and back seat occupants. Diana uses a composite steel and wood construction at the front end but still manages to obtain remarkably clear vision.

Other makes which were noticed to have what might be called truly "clear vision" windshields as described early in this article were, Jewett, Gardner, Rickenbacker, Paige, Dodge and Hupmobile. There may have been other makes which should be listed here but these are sufficient to show that the matter of clear vision is receiving well merited attention at the hands of body designers.

---

THE World Bestos Corp., 52 Vanderbilt Ave., New York, has placed on the market a new brake lining material known as World Bestos Grafild. Up to the present production has been small, because of limited manufacturing facilities, but a new factory has been equipped and was put in operation recently.

Grafild is said to differ materially from other brake linings in that the company manufactures its own yarn by a special process which makes it unnecessary to mix cotton with the asbestos. Hence there is no cotton content in the lining, the objection to which is that it begins to carbonize at temperatures below 350 deg. F.

The lining material is impregnated with a large percentage of graphite, which treatment is claimed to render the brake action independent of the temperature and humidity, as well as to eliminate squeal. The high heat conductivity of the graphite is considered to be an advantage in that it prevents the brake from attaining an excessive temperature. In addition to brake lining the World Bestos Corp. is putting out a lining for Ford transmissions, which is made of Heanite cord and is claimed to entirely eliminate chatter.

---

## *IN NEXT WEEK'S ISSUE*

## Annual S. A. E. Meeting

**NEXT week's issue of *Automotive Industries* (February 4) will be devoted chiefly to the Annual S. A. E. Meeting which is being held at Detroit this week.**

**The meeting will be reported in detail with a separate story of each session, giving an outline of the general discussion and a digest of the papers in each case.**

# Standard Milling Machine Hexes 1500 Spark Plugs Per Hour

***Equipping a Milwaukee No. 2-B plain vertical milling machine with three spindles and means for indexing the blanks permits output dependent only on loading speed.***

A STRIKING example of the pronounced trend toward the use of standard machine tools equipped with special tooling for the performance of specialized operations is provided by one of the recent developments of the Kearney and Trecker Corp. As the result of the latest combination, one spark plug manufacturer is producing the hexognal wrench surfaces on spark plugs at the rate of 1500 pieces per hour on a Milwaukee No. 2-B plain vertical milling machine. Further indication of the economy of the operation is the fact that 45,000 complete pieces are produced per grind of the cutters.

Straddle milling and double indexing constitute the routine which is time honored but the rate of 1500 pieces per hour is obtained by equipping the machine with three vertical spindles and means for indexing the blanks between the adjacent pairs of cutters. Further the fixture is arranged to serve as a rotary magazine of liberal capacity and unloading is made automatic. It is stated that the maximum capacity is purely a function of the speed of the operator who is engaged only in loading the fixture.

As shown in Fig. 1 in which the table bearing the fixture has been moved out of the normal operating position, a No. 2-B vertical plain Milwaukee milling machine is equipped with a special head which houses three vertical spindle assemblies. The middle spindle is placed on the centerline of the machine and the remaining two are spaced equidistantly at each side. Each of the spindles carries two pairs of 4 in. diameter high speed side mills and the speed of rotation is 168 r.p.m. The usual coolant line which conducts a soda solution in this case is arranged with a jet for each spindle. A slip plunger which locks the table and fixture in the normal working position is mounted in a boss cast in the special head.

### General Makeup of Fixture

General make-up of the fixture is described best by reference again to Fig. 1. Basically this unit is a built-up bridged cast iron structure which incorporates a K and T standard 14 in. rotary table driven by the regular telescopic cardan shaft from the gear box at the back of the machine as shown in Fig. 2. Upon this rotary table is mounted a hollow turret which carries two decks or layers of positive collets in a staggered arrangement. About 20 collets are mounted in each deck.

From this point outward, the construction and details of the fixture can be discussed to the best advantage by following through a complete cycle of operations. As shown by Fig. 2, the operator stands at the front of the machine and inserts blanks into the collets as they pass. In this operation the blank threaded end of the plug is inserted into the collet. As the wedge angle of these collets is less than 12 deg. no other means of locking them in the closed position are provided.

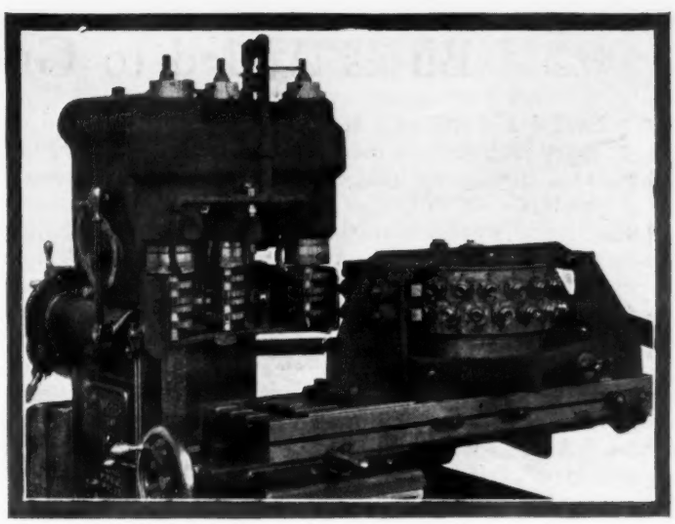


*Fig. 1. Special rotating fixture moved aside to show arrangement of arbors and indexing prongs. Note pressure cams at left end of fixture*

Operation is continuous and as the collets pass around to the left, the outer ends of the blanks contact with pressure cams which are shown at the left end of the fixture in Fig. 1. The action of these cams forces the collets into the closed position and locates the plugs in the proper radial position for the subsequent milling operation. Each

*Fig. 2. Special fixture in operation on standard plain vertical milling machine. Production rate of 1500 pieces per hr. is limited only by speed of operator*

collet is mounted in a rotary barrel slotted at its inner end to engage a guide disk arrangement and thus prevent rotation at all times except the indexing periods.

Each collet is locked and guided against rotation on its own axis as described, then passes around and between the first pair of straddle milling cutters. As the blank leaves the first pair of cutters, the inner end of the collet barrel enters a gap in the periphery of the guide disk. Simultaneously the first of the horizontal prongs shown between the arbors in Fig. 1 engages with the notches on the outer face of the collet barrel and continued travel indexes the whole unit through 120 deg. The two prongs are effective on both decks of collets. When indexing is completed, the notched inner end of the collet barrel again picks up the guide disk and passes through the next pair of cutters for the second operation. Following this, the procedure just described is repeated and the blank then passes between the third and final pair of cutters and the hexagon is completed. The effective rate of travel at the radius of the milled surfaces is 34 in. per min.

After leaving the third set of cutters and continuing on around, the inner end of each collet engages with a roller located inside of the turret and is pushed out and released. Immediately following this point is a spring operated ejection plunger, the action of which is controlled by a notched plate. This plunger shoots the milled blanks out of the collets into the chute shown in Fig. 2 and thence into the tote box. All of the mechanism involved in this fixture is located inside and is fully protected from dirt and chips. When an individual collet breaks or wears out in service, replacement can be made very readily without any necessity of tearing down the setup.

# Buses Added to Gramm & Kincaid Line

GRAMM & KINCAID Motors, Inc., has announced its entry into the bus manufacturing field with two bus chassis—a 20-passenger inter-city type and a 21-passenger city type bus.

The frame is pressed steel channel, 8½ by 3 by 3/16 in., of bridge type construction, 41 in. wide at the rear. Triple compensating semi-elliptic springs with cupped centers are used. The driving eyes are double wrapped. Rear springs are 60 in. by 3 in., and the front are 46 in. by 3 in.

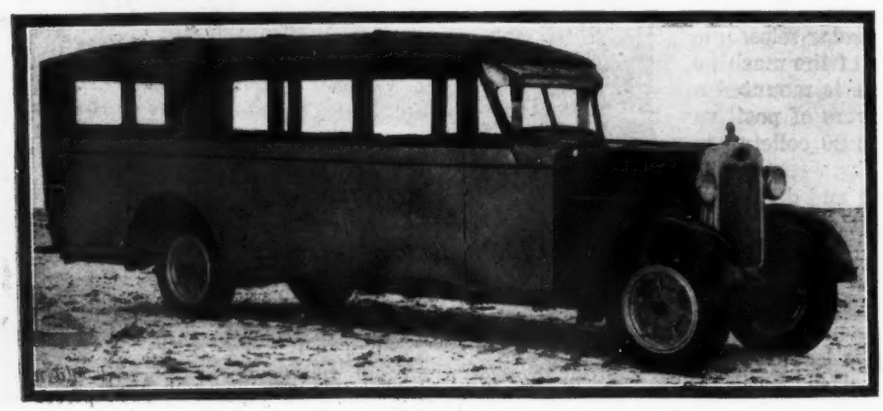
A Continental 3¾ by 5 in. Model 6-B engine is mounted integral with the three-speed transmission. Fuel is carried in a 25 gal. tank equipped with strainer and shut-off valve. A hot spot manifold is provided and a compound nozzle type carburetor. An air cleaner and preheating tube are also installed.

The electrical system includes a self-starter and a controlled type generator. The cast shell radiator is mounted on rubber shoes with recoil spring checks. The radiator core is of copper and brass, cork cushioned.

A tubular propeller shaft with oil tight universal joints transmits power to the banjo type semi-floating, bevel gear rear axle. Steering gear is Ross cam and lever. Four-wheel service brakes controlled by a foot pedal are internal and operate 4½ by 16 in. drums on the rear wheels and 2¼ by 16 in. drums on the front wheels. The emergency brake is hand operated and actuates a 9 by 4 in. drum just back of the transmission.

Metal wheels carry 32 by 6 in. cord tires. Single or dual rear tires are optional. Alemite lubrication system is used. Standard equipment includes oil pressure indicator, ammeter, ignition lock, lighting switch and carburetor choke control.

Chassis weight is 3800 lb. Road speed 60 m.p.h. Frame height is 20 in. at front and 21 in. at rear. Minimum clearance is 9 in. except where springs are underslung close to the wheels.



*Gramm & Kincaid inter-city type bus*

## Causes of Road Corrugation

THE phenomenon of surface corrugation on tarmacadam roads was discussed in a paper by E. L. Leeming at the Public Works, Roads and Transport Congress recently held in London. Mr. Leeming said this wave trouble came with the introduction of mechanically propelled traffic.

The motor omnibus was a vehicle driven from the back axle, and usually equipped with solid rubber tires, a combination which inflicted untold damage to the road. The rear axle drive was perfect only so long as the road was perfectly smooth, but even the best road did not possess that smoothness, with the result that vibration due to the drive was set up. On a smooth surface presenting an even tractive resistance, the drive at the wheel contact was horizontal, and its transmission to the vehicle was likewise horizontal. But no road offered a constant tractive resistance, and therefore a great deal depended on whether the variations were slight or serious. In the ultimate, when the rear wheel struck the opposite slope of a pothole or wave—and, in fact, the action was the same when tractive resistance increased—the drive was then partially upwards, and that sets up a periodic vibration which was easily repeated. Clearly the solid rubber tire, quickly shorn of its resilience by pressure and wear, was incapable of taking up those road inequalities, and the action was complete.

If pneumatic tires were not to become universal, then some improvement on the present rear axle drive would appear to be necessary. Actually, it would damp vibration considerably if the load could be pulled from the front axle instead of pushed from the rear. Six-wheel vehicles were a step in the right direction, and particularly those which provided four driving wheels. Anything which carried the load on six wheels—even though the load were greater than one on four wheels—must make its weight ride steadier along the road surface,

# *Just Among Ourselves*

### Mr. Schwab and the Price Problem

LEAVING for Europe a week ago, Charles Schwab said that the price of steel probably would go up about $5 in the near future. In urging this advance we assume that Mr. Schwab spoke rather as a steel manufacturer than as an automotive executive. What with the high price of rubber, growing merchandising costs, the need for keeping sales up and overhead down and numerous other contingencies facing the car makers at present, a lot of lead pencils probably are being chewed to a pulp figuring what car prices ought to be. Thus far most of the recent revisions have been downward, although there are several outstanding exceptions. In the face of material prices and probable material prices, it's difficult to see how any further or general reductions can come about. Still competitive conditions may become pressing.

* * *

### Who Built the First Eight-in-Line?

AN interesting side light on the question as to who built the first car with an eight-in-line engine is thrown by an item printed in *Oesterreichischer Motor* under the heading "Twenty Years Ago." A photograph reproduced from an automobile publication of that period shows the front end of a car with hood raised and bearing the caption "The eight-cylinder engine of the 200 hp. Bellamy car." The accompanying text reads in part as follows:

"The French manufacturer Bellamy recently built for a young American, Miss Hockenhull, a car which is intended to smash all world's speed records. The eight-cylinder engine is said to develop 200 hp. and is expected to give the car a speed of 185 km. (115 m.p.h.) The frame is of channel steel, perforated to reduce the weight. Speed control is by means of the engine, any desired number of the cylinders of which can be cut out. * * * This extraordinary machine is to be driven by Miss Hockenhull herself. * * *"

The machine failed to break world's records, but it evidently has a claim to fame as the forerunner of a type which later became quite popular.

* * *

### Time Now for Production Confessions

CONFESSION magazines are so popular these days we'll have to get in the game with a few "I confess's" ourselves or be left behind. Well, here goes. About this time last year we guessed that total motor vehicle production for the year would be about 3,750,000. Final figures show that it was about 4,300,000. That makes us wrong by 551,000 or about 12.8 per cent. If anybody asks us about it, we're going to do all our talking in percentages because 12.8 is so much smaller than 551,000. Percentages are great things; they can make small production increases look big and big production gains look small; they can make statisticians look like liars and liars look like statisticians; they can make weak companies look strong and strong companies look weak; they can make small salary raises look attractive and large raises look unattractive. . . . Percentages, here's to 'em!

* * *

### Interesting Departure in Association Publication

MERCHANTS Association of New York has begun an interesting departure in association publication work. It has discontinued its magazine "Greater New York," and has substituted for it a Service Bulletin, nine inches long and four inches wide, in which information and news for the membership is presented in telegraphic form. A note is appended to each item stating that "detailed reports on any of the subjects digested in this bulletin will be forwarded to members on application to the secretary." The basic idea of the new publication was to produce something which could be read by a busy man in the shortest possible time. This form was chosen for its effectiveness and not for cheapness; it is said to cost more than the previous magazine form. "I am particularly interested in this idea," says A. C. Pearson, vice-president, United Publishers Corp., and a member of the committee which developed the new publication, "because, among other things, it is a complete answer to the objection of business papers in general that associations put out official publications soliciting advertising largely on an improper basis and secure entry to the Post Office as second class mail under a subterfuge."

* * *

### Spirit of Adventure Still is Alive

EVERY day fresh evidence piles up that the spirit of adventure and romance—which we of this somewhat unplastic age usually associate with days gone by—still lives.

W. W. Nutting's final adventure in retracing the trail of the Vikings in a small motor-equipped sail boat was one of the most inspiring of recent adventures of this kind. That sad journey is recalled by a letter received yesterday from four young Germans who want financial assistance in preparing to go from Hamburg to New York without touching land, in a motor boat equipped with sail. The writer is Hans Friedrich, Hauptpostlagernd, Stettin, Germany. Something of this same courage must have been in those men who pioneered motor vehicle development in this country. No, the spirit of adventure isn't dead. —N. G. S.

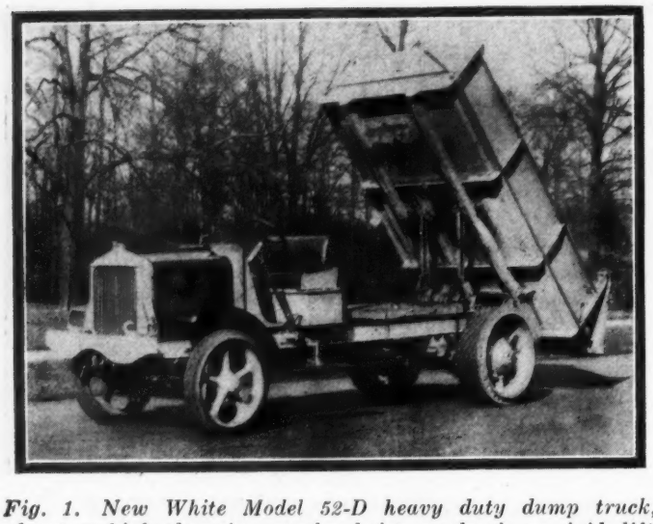


*Fig. 1. New White Model 52-D heavy duty dump truck, showing high dumping angle, hoist mechanism, rigid lift arms and new radiator and bumper*

# White Develops Dump Truck With Auxiliary Transmission and Gear Type Hoist

***New heavy-duty unit has a tapered dump body, an improved lubrication system and double reduction gear drive.***

THE White Company of Cleveland has announced its new heavy duty Model 52 D, a dump truck built along the same general lines as the Model 45 D but with several changes.

The new truck has an auxiliary transmission affording the equivalent of five speeds giving extra low gear power for hill climbing and getting out of holes and mire; a new dumping mechanism and tapered dump body; an improved and patented oil system and the exclusive White double reduction gear drive.

Other new features include a large tubular type radiator, spring cradles on the frame; a wide heavy pressed steel bumper; heavier and easier working steering gear; chrome nickel steel, and brakes with drums of special material which is said to insure quick certain stopping and long brake life.

All the power driving units such as the engine, transmission, rear axle and dumping mechanism are encased and run in oil.

A gear type hoist has been adopted as standard equipment for the dumping mechanism of this new model. This is of the under body horizontal type driven by a shaft from the power tower. It is made up of a main worm shaft and worm gear operating through a double train of heavy spur gears giving a total reduction of 350 to 1. A positive automatic cut-off prevents over running when the body is being raised or lowered and a one way drive makes it impossible to apply the power in the wrong direction.

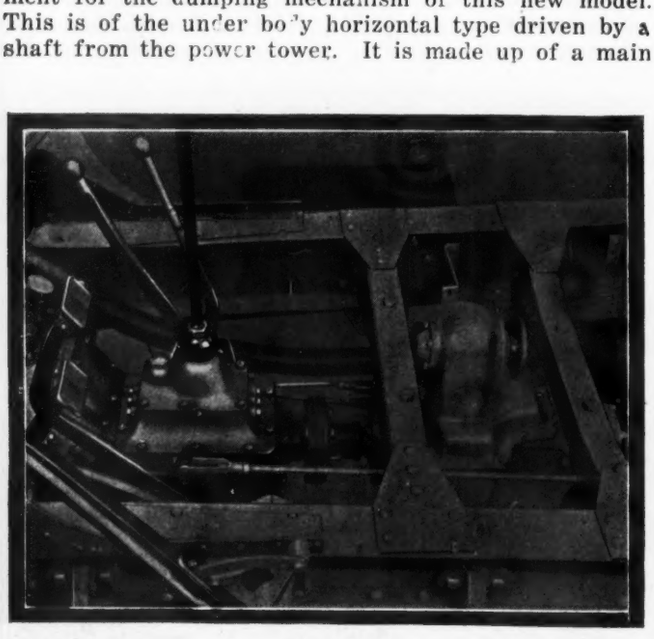


*Fig. 2. An auxiliary transmission provides an extra super-low gear which gives increased pulling power without sacrificing regular driving speeds*

A double purpose power transmission has been developed which combines a power driving tower for operating the dumping mechanism with a low gear power transmission which can be used to increase the driving torque when the power required to drive the truck is beyond the capacity of the low gear speed of the standard transmission. The complete assembly is in one unit placed under the driver's seat. Its location in the power line is between the rear axle and the regular truck transmission.

### Two-Section Propeller Shaft

A two section propeller shaft is used, the middle ends of which terminate in the power transmission housing. This enables the driver to operate through the auxilliary transmission when necessary and at the same time permits the operation of the dumping hoist when the truck is standing or in motion.

The power tower is operated by a gear mounted on the propeller shaft. This gear is actuated through a hand lever by means of a sliding positive clutch on a splined section of the shaft. The power from this gear is transmitted through an idler gear to the secondary gear which drives the shaft to the dumping hoist. This clutch is coupled to the operating clutch on the dump hoist so that one hand lever suffices for both.

The capacity of the oil pump has been increased 25 per cent which, combined with an extra large reservoir, insures a copious supply of oil to all parts of the engine. Oil is forced from the pump through a main delivery tube which has outlets to the main bearings, camshaft, crank pin bearings and timing gear housing. An adjustable orifice and an automatic blow-off valve control the pressure which is proportional to the speed of the engine. All oil is filtered through a patented sediment trap.

The standard dumping body mounted on this chassis is of five cubic yards capacity. It measures 11 ft. long by 6 ft. wide by 25 in. high. It is constructed of

3/16 in. steel plate the bottom and sides being formed of two pressed steel plates with a watertight center joint running longitudinally and fully supported by a heavy splice bar throughout its entire length.

The body is four inches wider at the rear than at the front to insure easy dumping. The sides are low enough for hand loading and the ends are built up six inches higher than the sides so that extension sides may be used to increase the capacity.

The chassis frame is chrome nickel steel of 8 in. I-beam construction, heavily gusseted and riveted at the tops and bottoms of the main cross members. The front end is reinforced by a heavy pressed steel bumper. Reinforced cast steel anchor brackets are provided for the front end of the radius rods which take driving loads from the rear axle.

The engine is the White GRB with modified cylinder blocks, valves and valve ports to improve the cooling of valves and stems and increase the all round efficiency of the engine. The manifold is fitted with a hot air stove. Combustion chambers are machined all over which, with balanced pistons, connecting rods and crankshaft, insures an even distribution of power throughout all four cylinders.

The rear axle is the standard White double reduction type. The front axle is like that used on the Model 45-D except that taper roller bearings are used for their superior thrust load capacity. Rear springs are of the double sweep type, 52 in. long and are built up of 14 leaves of 5 in. by ⅜ in. oil tempered silicon-manganese steel with a rebound plate on the top. Front springs have 13 leaves of 3 in. steel and are 44 in. long.

The engine has been tilted downward toward the rear to make straight line drive possible under normal load. Wheelbase is 156 in.

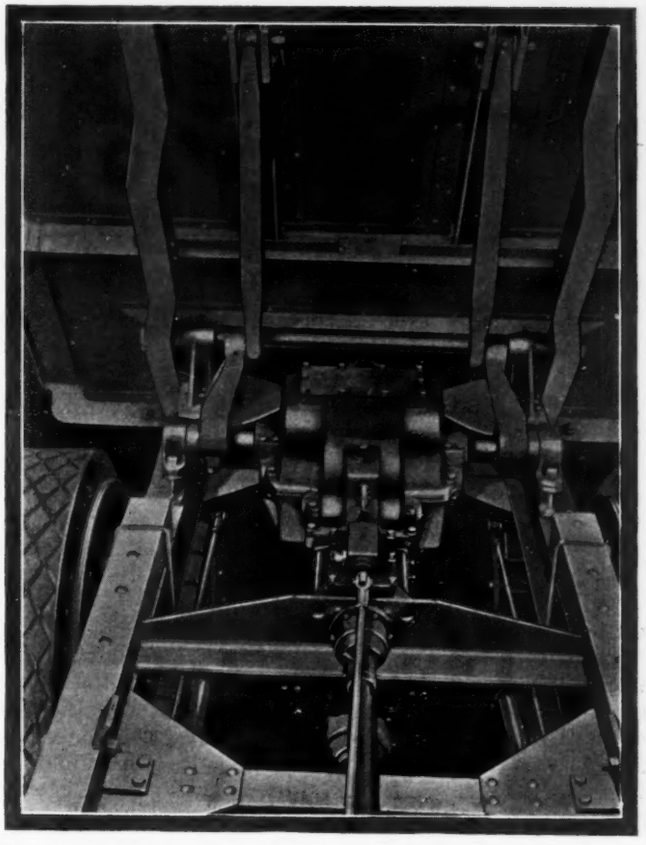
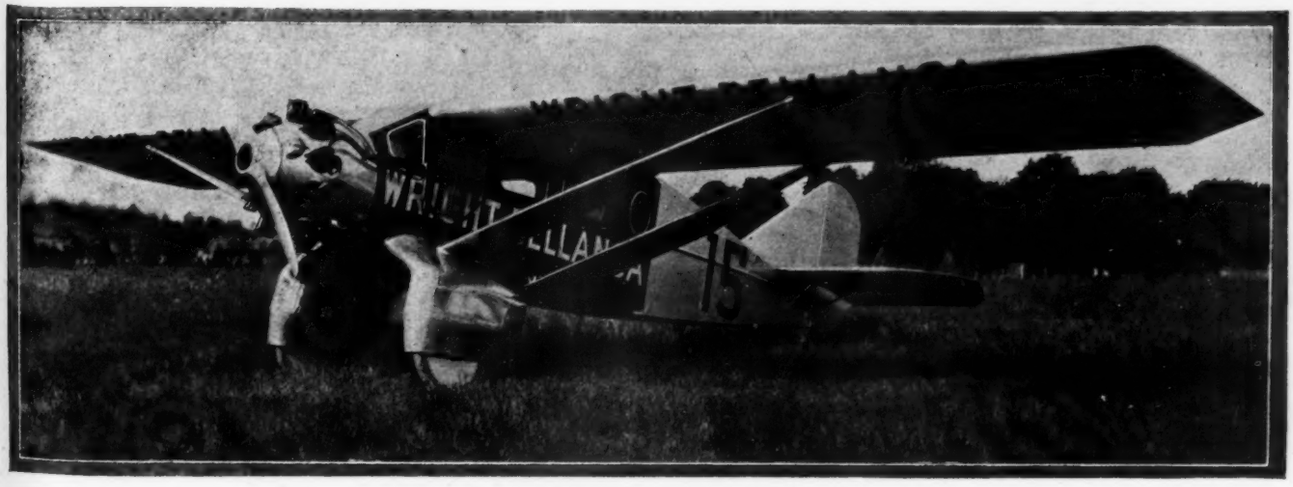


*Fig. 3. This gear type hoist lifts the body to an angle of more than 50 degrees and dumps the load free of the rear wheels. It is always under positive control and holds the body at any angle*

# Wright-Bellanca Plane Has High Efficiency

ONE of the most efficient commercial planes designed in this country during the past year is the Wright-Bellanca cabin monoplane built by the Wright Aeronautical Corporation and equipped with a Wright J-4 200 h. p. radial air-cooled engine. This plane has accommodations for six passengers and its high performance characteristics enable it to cruise at 100 miles per hour and 55% of full throttle power with a fuel consumption of eight miles to the gallon. One of the unusual features is the use of aerofoil type wing struts, which provide an additional lift more than equal to their weight and are said to increase the stability of the plane due to an exaggerated dihedral. With a top speed of about 138 miles per hour, a landing speed of 42 miles per hour, a short take-off, and an initial climb of 900 feet per minute, the plane is capable of being operated from small fields.

The plane, carrying 1000 lb. of pay load, won the Efficiency Race at the 1925 National Air Races, scoring 50 per cent more points in the race than its nearest competitor. The ship complete with engine sells for $12,000.



*The Wright-Bellanca cabin monoplane*

# Automatic Systems Give Best Results in Temperature Control

**Instruments are usually grouped in a central station, and while control of the temperature is automatic, signals are flashed to furnace attendants by colored lights. Various systems described.**

*By P. M. Heldt*

THE most advanced practice in furnace and oven control is automatic central station control with automatic signals to the furnace attendant. This calls for a controller of either the indicating or recording type for each furnace. One advantage of such an installation is that one of the signal lamps is burning at all times, so that the operator has always before him an indication of the temperature in the furnace, while with the single indicator and switchboard system he gets a signal only at intervals and is without definite information between signals.

With such an automatic system the temperature can be maintained within much closer limits than is possible with hand control, and hence the product that passes through the oven or furnace may be expected to be more nearly uniform. A pyrometer room, installed in one of the large automobile plants by the Leeds & Northrup Co., is shown in Fig. 1.

Furnaces or ovens in which the temperature is to be controlled are heated either by gaseous or liquid fuel or by electric current. In order to control the heating effect, in the first case a valve must be operated, and in the second an electric switch. The method of control generally consists in shutting off one burner or turning it down low, while a second or pilot burner keeps burning all the time. Similarly, with electrically-heated ovens, a number of heating units are used of which some are kept going all the time while the others have the current switched on and off by the control device.

Valves and the switches of the electric heater units as a rule are not operated directly by the current controlled by the pyrometer through control contacts, but through re-

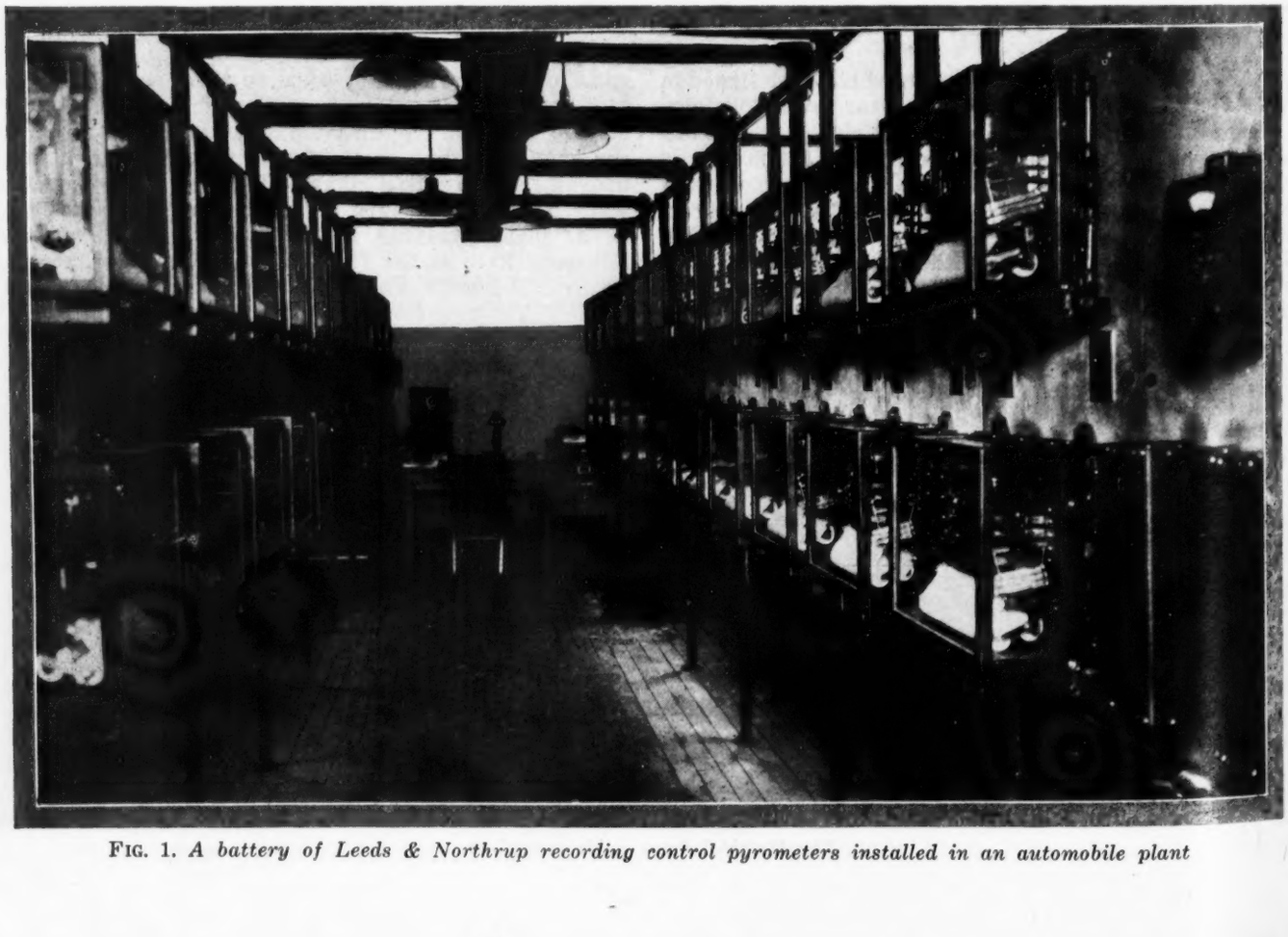


FIG. 1. *A battery of Leeds & Northrup recording control pyrometers installed in an automobile plant*

lays. When the pyrometer closes the control contact, a current flows through the coil of the relay, and the relay, in attracting its armature, opens or closes the switch or the valve.

The control pyrometers made by the Leeds & Northrup Co. are similar to the recording pyrometers of the same firm (already described) and generally combine the recording and control mechanism. The disks which carry the slide wire are provided with cam lobes and these cams operate the control contacts. The cams are adjustable and can be so set that a movement of 1/32 in. from the neutral point will open the control contacts. This corresponds to a temperature change of 2 deg. when the instrument has a temperature range of 1,000 deg. In most installations the control contacts close the circuit through a relay, which in turn opens or closes a heater circuit or controls a fuel valve or damper.

### The Brown Pyrometer

An indicating control pyrometer is made by the Brown Instrument Co., Philadelphia. The instrument gives a direct reading of the temperature and has compensation for changes in cold junction temperature and in instrument temperature.

Referring to Fig. 2, the contact mechanism actuating the control comprises two pairs of tungsten contacts, *H* and *I*, mounted on a table *J* which also carries an index *K*, the whole table being quickly adjustable. Let us assume that the temperature of the furnace is to be maintained at 950 deg. F. The index *K* is set at 950 deg. and the thermo-couple is inserted in the furnace.

Every 30 seconds the electric motor *M* in the base of the instrument causes pointer *R* to be depressed. When the temperature is below 950 deg. F. the low temperature contact points *F* or *I* will be brought together, under which condition the valve remains open and fuel continues to be fed to the furnace. On the other hand, if the temperature happens to be in excess of 950 deg., then the "high temperature" contacts *H* will be brought together, and in consequence the fuel valve will be partly closed and the rate of fuel feed reduced.

This temperature control pyrometer, as well as others of the type, is used in conjunction with a relay, by means of which the comparatively feeble current that can be allowed to flow through the instrument contacts can be made to close a circuit capable of carrying a far more powerful current. The type of relay used by the Brown Instrument Co. is illustrated in Fig. 3. It has an auxiliary contact which completes the circuit through the holding coil when the relay closes. The relay is opened by short-circuiting the holding coil, which is connected to the external circuit through a series resistor. The circuit is made at the instrument contacts, but is not broken there.

An automatic control system embodying novel principles has been developed by Wilson-Maeulen Co., Inc., New York. This system comprises three units, viz., an electric motor, a worm and pinion type speed reducer, and a control unit. The control unit operates on the potentiometer principle. One branch of the potentiometer circuit is formed by a thermo-couple, located at the point where the temperature is to be controlled, and a very sensitive galvanometer is connected to the circuit at one fixed point and at one movable point (on a slide wire). By moving the connection along the calibrated slide wire the control unit can be set for different temperatures. Then, if the temperature at the point to be controlled exceeds the temperature set for, current will flow through the galvanometer in one direction, and the pointer of the galvanometer will deflect correspondingly, whereas if the temperature is below that

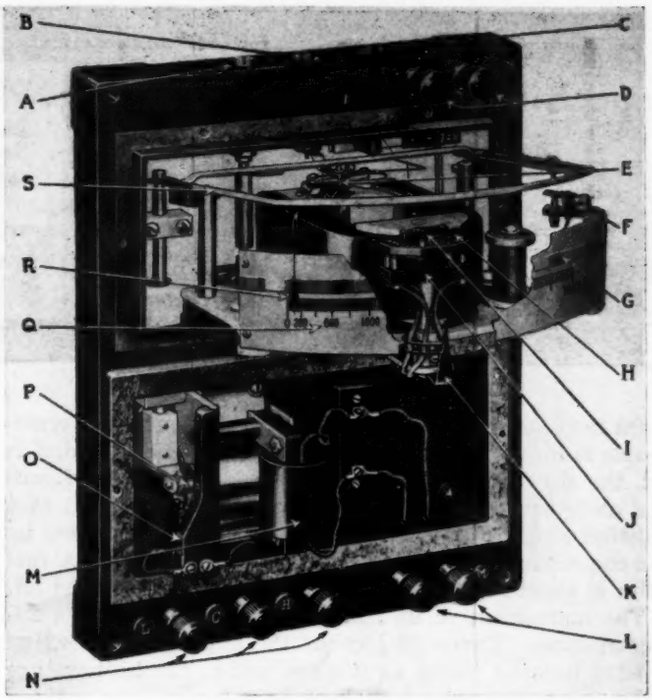



FIG. 2. *Brown indicating control pyrometer*

set for, the current will flow through the galvanometer, and the pointer will deflect, in the opposite direction.

The electric motor used is a constant speed type of 1/6 hp. and is furnished for either direct or alternating current. Its function is to operate the cam which opens and closes the circuit of the valve operating system, or, in the case of electrically heated ovens, the switch operating system. It operates through a reducing gear which reduces the speed from approximately 1800 to 3 r. p. m., at which speed it rotates a cam located in the control unit.

This cam raises and lowers a contact carrying arm, and when the arm is in its uppermost position the instrument pointer is free to assume a position corresponding to the temperature at the thermo-couple. As the cam revolves it permits the arm to descend, to one of two positions, according to the high or low deflection of the pointer.

### Circuit Closing Arm

When the temperature of the thermo-couple is lower than the temperature at which the dial is set, the galanvometer pointer deflects to the left of zero and does not obstruct the descent of the arm, which returns to its lowest position, and a moment later a positively operated circuit closing arm moves in and closes the circuit which opens the fuel valve or closes the switch of a heater unit.

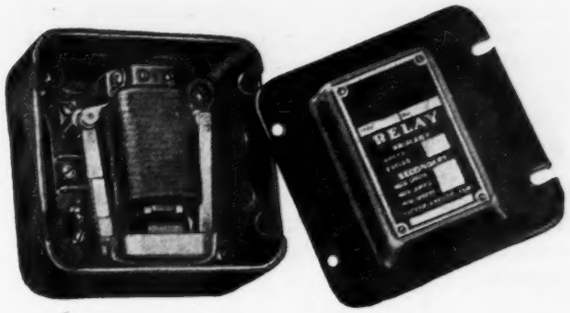



FIG. 3. *Brown relay for automatic temperature control installations*

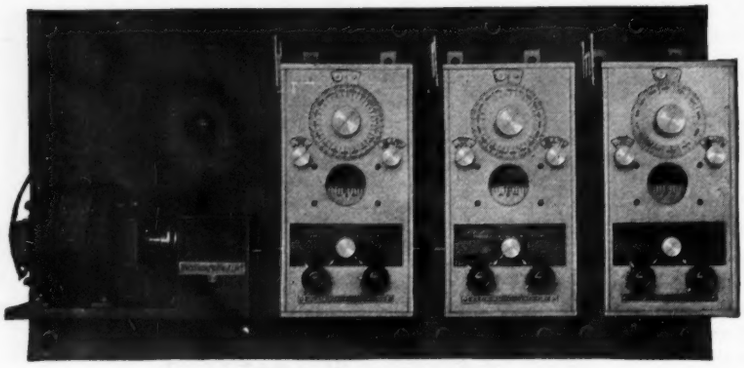


FIG. 4. *Wilson Maeulen automatic temperature controller*

On the other hand, when the temperature of the thermo-couple is higher than the temperature at which the dial is set, the galvanometer pointer deflects to the right of zero and obstructs the descent of the arm, thus holding it at a position where a different set of contacts will be closed by the contact-making arm when it moves in, and thus a fuel valve is closed, or electric heating current is switched off.

The instrument in its standard form operates on a 20-second cycle. Every 20 seconds the temperature reading is automatically taken, as it were, and if the temperature is too high, the supply of heat is automatically reduced or cut off, and vice versa. The instrument can also be obtained in a form to operate on a 10-second cycle, but few operations have been found to require this frequency.

The control unit is set for different temperatures by means of a knob and dial on its front. This dial has a circumference of 12 inches, affording an open scale, and therefore permitting close settings. The effect of moving the dial, of course, is to move the point of contact on the slide wire of the potentiometer. On the front of the control unit is a zero adjusting device, which acts on the strip suspension of the galvanometer. Owing to the use of the potentiometer principle, dry cells must be used with this controller.

### Exact Temperature Ascertained

The divisions of the scale across which the pointer deflects, as a rule, do not show exact degrees of deviation from the temperature set for, because to make them do so would necessitate a knowledge of the resistance of the thermo-couple circuit when the instrument was calibrated (or the scale divided). However, the exact temperature at the point to be controlled can at all times be ascertained by moving the temperature setting knob until the indicator shows no deflection, and then reading off the dial, as in any other temperature measuring potentiometer.

The question naturally arises, what would happen to the furnace if the thermo-couple should burn out, or the circuit become open through any other accident? In that case no currrent can flow through the galvanometer, and the pointer of the latter immediately moves to the zero position, where it obstructs the descending bar, putting it in a position where the proper contacts will be closed by the contact arm, for closing the fuel valve, or opening the electric heating current switch, as the case may be.

It may also occur that the current supply to the operating motor is cut off, and various means are available to prevent injury to the furnace and the charge in that event. For instance, if the furnace is of the electrically-heated type, it is advisable to operate the motor from the same circuit as the heating coils, so that if the supply of current to the motor fails, that to the heaters fails also. Where gas or oil-fired furnaces are to be controlled the fuel control valves are generally operated either by a solenoid or an electric motor, and the solenoid types are usually so arranged that they require current to remain open, and close automatically when the current ceases, so that if these valve-operating devices receives their current from the same source as the control-unit-operating motor, no damage can be done through failure of the source of current. Special protection devices are available for motor-operated oil or gas fuel valves.

The motor and reducing gear unit can be used for a number of control units. The latter are mounted side by side, their camshafts being provided with slotted ends, so the different units can be readily connected together.

In the Newcomb automatic valve regulator, manufactured by Charles Engelhard, Inc., New York, an electric motor is provided which drives both an escapement mechanism and a generator generating current for energizing a pair of solenoids. The motor is of 1/12 hp. and runs at 1200 r.p.m., being furnished to operate on either A.C. or D.C., 110 or 220 volts. The generator, directly below the motor and driven from it by silent chain, generates 12 volts and has a capacity of 25 watts. By means of a worm gear the motor shaft speed is reduced in the ratio of 80 to 1. On the worm gear shaft there is an adjustable crankpin which imparts motion to the lever arm of the escapement mechanism.

Two solenoids mounted on the swinging lever arm contain plungers which connect to opposite ends of a pawl yoke pivoted at its center. Normally the yoke occupies a central position, so that neither of the pawls is in engagement with the ratchet wheel, and it is held positively in this position by a spring-pressed roller engaging in a V slot. The arm carrying the solenoids and ratchet yoke swings around the axis of the ratchet wheel. Motion is transmitted to the ratchet wheel and its shaft only when

**THE accompanying article is the third of a series by Mr. Heldt on the general subject of temperature measurement and control in automotive production. The first article, appearing in the issue of December 24, discussed the construction and use of thermo-couples. Indicating and recording pyrometers were dealt with in the issue of January 21, and in the present instance several systems of automatic temperature control are described. The series will be concluded with another article in the near future.**

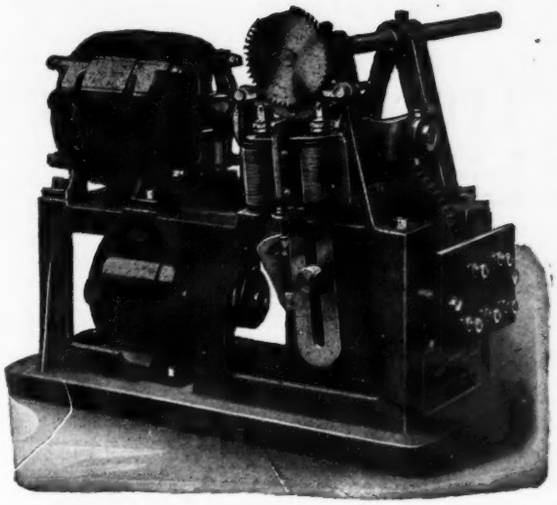


FIG. 5. *Newcomb automatic valve regulator*

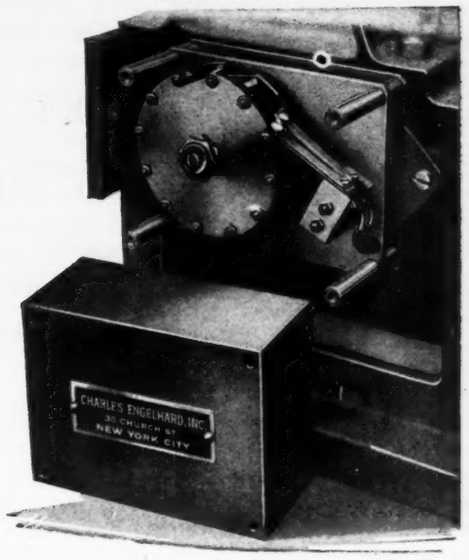



FIG. 6. *Timer of Newcomb automatic regulator*

one of the pawls is thrown in. The pawls are actuated by the solenoids, the right pawl being engaged when the left solenoid is energized, and vice versa. The swinging motion of the arm then turns the ratchet wheel around step by step, until the blank space in the edge of the wheel comes opposite the pawl, the maximum range of movement being 220 deg.

If the ratchet spindle is connected to a valve or other device where the variation necessary between minimum and maximum limits should exceed 220 deg., the ratchet wheel is provided with a full complement of teeth, and limit switches are mounted on a traveling bushing attached to the ratchet spindle and mounted between the main bearings. This limit switch is adjustable so that the ratchet wheel can be turned through any number of revolutions up to about 50.

Usually the fuel control valve is connected to the shaft of the ratchet wheel by a chain and sprockets. The solenoids are in circuit with the contacts of the instrument.

### Timer a Part of Apparatus

The control apparatus also comprises a timer, which is illustrated in Fig. 6. This has two disks mounted side by side on the same shaft, that of the worm wheel. Each of the disks has twelve pins set in its face, and as the disks turn, the pins of each engage with a flat spring carrying a silver contact, raising it and letting it fall successively. The pins of one disk have a slight angular lead over those of the other, hence one of the flat springs begins to rise before the other. When the flat spring opposite the leading disk snaps off its pin, its silver contact will abut against the contact of the other spring, and current then can flow from the control contacts on the instrument to the solenoids. A moment later the second spring snaps off its pin; contact is then broken and the current stops flowing.

It should be noted that the frequency with which the circuit is closed and broken depends upon the number of pins in each disk, while the duration of contact depends upon the lead of one of the disks over the other. The disks normally make one revolution in 12 minutes, and with twelve pins in each, a contact is made once every minute. Both the frequency and the duration of contact are adjustable. Moreover, the crankpin of the swinging lever can be set so the pawls pass one, two or three teeth per swing.

The full adjustability, of sprocket ratios between ratchet spindle and valve, of the crank pin and as to timing, is such that a valve can be turned as little as 1/400th of one revolution in 12 minutes and up to 4.8 revolutions in 40 seconds. The timing feature and extraordinary flexibility permit of adjustments eliminating the "hunting" action said to be common with large furnaces when regulators of the "open-shut" type are used.

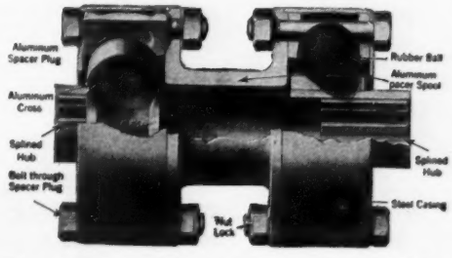
## Spicer Ball Universal Joint

A CUSHION ball universal joint has been added to the line of the Spicer Mfg. Co., South Plainfield, N. J. It is intended primarily for use in propeller shafts where the angularity is limited, as well as for use as a cushioning connection between the clutch and gearset on cars of all sizes. We are informed that the marketing of this new product was preceded by five years of development work.

There are eight balls in each joint. An aluminum cross is fastened to the end of each of the connected shafts, each face of each arm of the cross being cupped to receive one of the balls. There are thus two balls between adjacent arms of each cross, and between these two balls there is a spacer plug which is bolted to the steel housing of the joint.

The balls are held in place in the housing under light compression, which prevents them from moving around and chafing, but allows the rubber to be compressed as the angle of the joint changes. There being no metal-to-metal contact of moving parts, no lubricant is needed.

Although the joint is capable of more than 30 deg. angular flexure, it is recommended only for uses where the driving angle normally does not exceed 3 deg. Shocks in the driving line are cushioned by the deformability and compressibility of the rubber and the joint is claimed to be absolutely noiseless in operation.




*New Spicer rubber type of universal joint*

# "Buddy" ¾-ton Speed Truck is Added to Stewart Line

**Six-cylinder Continental engine, pressure feed lubrication, unit power plant and two body types are standard.**

*By Lloyd S. Graham*

"BUDDY" STEWART, a three-quarter ton truck, is the latest in the commercial vehicle line of the Stewart Motor Corp., Buffalo, N. Y. The chassis lists at $895.

Sturdiness of construction is emphasized. It has a five-inch frame and a ten-inch single plate clutch, bevel axle and Timken bearings in each axle. "Buddy" Stewart is powered with six cylinder Continental motor having a bore of 2¾ in. and a stroke of 4¾ in., developing 40 hp. on the block. It has a four-bearing crankshaft with pressure feed lubrication, removable cylinder head and equipped with water pump.

The ignition system is a product of Remy and is engine driven and a direct gear-driven Remy generator is used with a Remy starter and Bendix gear-shift. The carburetor is a Zenith product. A cellular type radiator is used with a pressed steel shell.

The transmission is the unit power plant type, three forward speeds and one reverse and bolted direct to the bell housing of the engine. Shafts are mounted on annular bearings. The frame consists of pressed steel side rails, 5 in. deep at the point of greatest depth.

The worm and gear type of steering gear, a Gemmer product, is used with the conventional friction type of spark and gasoline control levers on the top of the steering wheel. Push button for the electric horn is on top the steering post. The angle of the steering post is set to give the maximum comfort in driving.

The front axle is the drop forged I-beam type with heavy knuckles and the hubs equipped with Timken roller bearings. The front springs are 38½ in. long and 2¼ in wide, equipped with bronze bushings and ¾ in. diameter spring pins. The springs at the rear are 50 in. long and 2½ in. wide with spring pins in bronze bushings 1 in. in diameter.

A truck type rear axle is used, the housing being a single piece, heavy-gage pressed steel. It has a spiral bevel gear with straddle mounted pinion. There is a heavy type differential mounted on Timken roller bearings. The axle shafts are 1¾ in. in diameter nickel steel, semi-floating type carried on Timken roller bearings. The design and construction of this axle is unusually rugged for the service ordinarily required.

The service brakes are of the external contracting type, 14 in. in diameter and 2 in. in width, operating on pressed steel drums on rear wheels. The hand brake is also the external contracting type mounted on the transmission, 8 in. in diameter and 2 in. in width.

### 1¾ In. Drive Shaft

There is a 1¾ in. drive shaft, equipped with metal covered dust-proof and oil tight joints.

The wheel base is 118 in. and the tread is 56 in. Wood wheels are used, with twelve spokes, oval shape, truck type, equipped with demountable rims which bear 32 x 4 pneumatic cord tires.

The equipment includes electric lights, electric starter, electric horn, tool kit, grease gun and pack. The instrument board carries ammeter, oil gage, starting choke, lighting and ignition switches. The speedometer is included as standard equipment, as are the crown front fenders.

The chassis weight is 2,250 lbs.

In speed tests "Buddy" Stewart will throttle down easily to four miles per hour and will run up to a maximum speed of forty miles an hour with the motor performing quietly and smoothly. Claims of unusually good gasoline mileage—18 to 22 miles per gallon—are also made for it. It has been designed also with the idea of producing a light truck with a road appearance as pleasing as possible. It is adapted for the use of 7-foot bodies back of the driver's seat. Two types of Stewart-built bodies are featured with

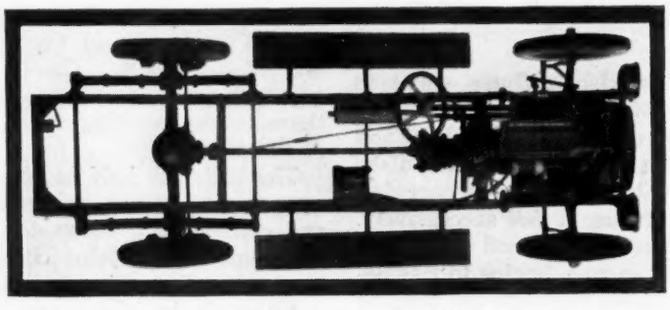


*Fig. 1. View of chassis of new "Buddy" Stewart ¾-ton speed truck*

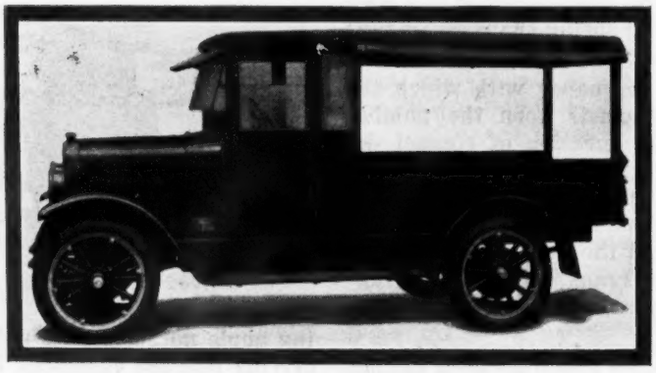


*Fig. 2. Covered express body, listing at $245 mounted on "Buddy" Stewart chassis listing at $895*

"Buddy" Stewart. Both have closed cabs built integral with the body, 44¼ in. wide, with seats 20 in. deep and doors 24 in. wide. The windshield opens outward. The windows raise or lower by standard window regulators and there is a sun shield over the glass front.

The covered express body with integral closed cab lists at $245. This body is 45 in. wide and 7 ft. long. Height from floor to ceiling is 52½ in. The flare boards are 6½ in. wide and the tail gate is 13 in. high.

The second is a panel body with closed front, listing, with integral cab at $280. This is also 45 in. wide and 7 ft. long and has two doors full-length at the rear.

The manufacturer claims that these two bodies are so designed and constructed that they fill 90 per cent of all customers' requirements. The flooring is protected by metal straps and the framework is entirely of hard wood. Bolts and screws are used in the flooring and to tie the framework together.

## New Oil Testing Machine

A MACHINE for determining the lubricating value of cylinder oils under conditions similar to those existing in gasoline engines has been designed by Thomas Rodgers, city paving chemist, Paul M. Johanning, mechanical engineer of the department of public works, and Joseph W. Nicholson, chief buyer, all of Milwaukee. The machine was designed to permit the city to compare the lubricating oils which are on the market today, in order that purchases may be made on a competitive basis, giving the city the highest quality of oil obtainable at the lowest price. This machine is installed in a laboratory in the city hall, where tests have been made on nineteen samples of oil. From the results of these tests, graphs were made, showing the relative values of the oils tested.

The machine was designed only after an extended inquiry had shown that no such machine had ever been produced successfully. A 3 inch shaft is run in a bearing lubricated with the oil to be tested, by an electric motor. A load which can be varied from 20 to 2,000 pounds is placed on this bearing. The current consumed by the motor is measured at stated intervals, and it is noticeable that the current varies with the temperature of the oil. The temperature of the oil, which is raised by the friction, is measured at stated intervals.

The testing machine is equipped with a heating coil which permits of raising the oil to very high temperatures. The highest temperature to which the oil has been heated thus far has been 175 deg. C. (347 deg. F.) A sudden increase in the current consumed by the motor when the temperature of the oil is high indicates that the oil has broken down under the extreme heat. This breaking down of the oil is a very important factor, as some oils may give very good lubrication for a certain number of hours, and then suddenly disintegrate to such an extent that their lubricating value is very much reduced. Viscosity readings are taken by relieving the bearing of its load and then reading the current consumption.

The friction of the bearing is indicated by the current consumption under load; the viscosity of the oil, by the current consumption without load the friction may also be determined from the rise in temperature of the oil; likewise the breakdown point of the oil at high temperatures may be determined.

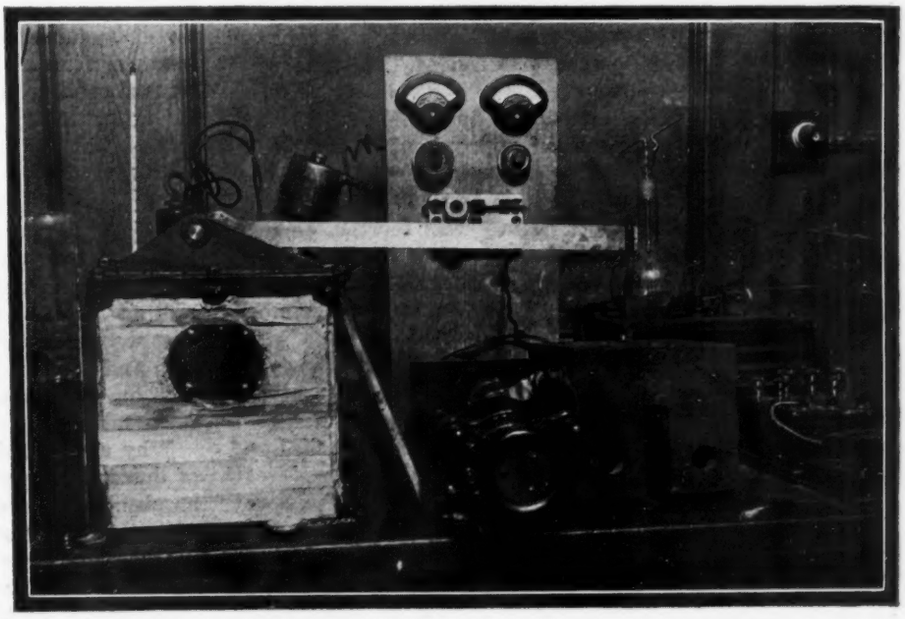
It is planned to enclose the entire machine in a cabinet provided with a lock, and to have all readings registered automatically on charts moved by clockwork. In this way the human element would be eliminated from the results of the tests to a large extent.

## Reamer for Steering Head Bushings

A REAMER specially designed to ream out the bushings in steering knuckles or front axle ends through which the knuckle pin passes, has been placed on the market by the Watervliet Tool Co. of Albany, N. Y. This firm has been specializing on reamers for the automobile trade for many years. For reaming the bushings in which the knuckle pin turns a special reamer is required in order that the reamed holes of the two bushings may be absolutely in line and that shatter may be prevented. The Watervliet spiral pilot reamer is claimed to accomplish this object. This reamer is sufficiently long so that the front pilot enters the second bushing before the reamer starts cutting in the first one, and the rear pilot is long enough so that the second or lower bushing is completely reamed before the shank or rear guide leaves the first bushing. This brings both bushings in perfect alignment over their entire length, it is claimed.

*Watervliet spiral pilot reamer*

UNDER a new finance law which went into effect some months ago, owners of public service automobiles in France pay a tax of 48 francs per tax horse power per year, the minimum rating considered being 5 hp. For other, that is, for private vehicles, the tax is 48 francs for each of the first 5 hp., 60 francs for each of the next 5, 72 francs for each of the next ten, 84 francs for each of the next ten and 96 francs for each additional horse power. For motor trucks the tax is 60 francs per tax horse power. The tax on motorcycles is 20 francs per hp.


*Oil testing machine developed by Milwaukee municipal engineers*

# THE FORUM

## Use of Diesel Engine for Buses Predicted

*Editor* AUTOMOTIVE INDUSTRIES:

Considering W. L. Dempsey's letter (Dec. 10 issue) in the light of several years' experience designing and testing small Diesel engines, I find it impossible to agree with him unless by "Diesel" he means the hot-bulb or semi-Diesel type which comprises the bulk of the smaller oil engines used in this country.

The hot-bulb engine is admittedly difficult, or rather inconvenient to start and, compared with a modern automobile engine, decidedly inflexible, but the true Diesel is quite a different case. Any well designed and properly built Diesel engine will usually start on the first few strokes and carry full load in from 15 to 30 seconds, and, in addition, be fully as flexible as any gas engine of corresponding cylinder size. In fact, a Diesel can pick up under load quicker than any other type of internal combustion engine, due to the fact that a full charge of air is always present in the cylinder and the fuel charge can be varied from idle to maximum almost instantly.

### Vaporization Should Be Complete

Mr. Dempsey's statement that vaporization cannot be as complete in a Diesel as in an Otto cycle engine, due to the shorter period of time, would be correct if all other conditions remained the same, but they most decidedly do not. In the first place, compression in a Diesel is almost always over 350 lb. per sq. in. (sometimes as high as 550 lb.) compared with an average of 85 lb. for the Otto cycle. Temperatures are correspondingly multiplied, and this in turn accelerates vaporization tremendously.

Another point of difference is the degree of atomization obtained mechanically, the importance of which cannot be minimized, as it is a painfully self-evident fact that one-hundred small drops will absorb heat and vaporize may times as fast as one large drop of the same total volume.

A certain solid injection engine upon which I worked, having a piston displacement of approximately 200 cu. in. per cylinder, injected the fuel through an orifice 0.006 in. in diameter under pressures as high as 10,000 lb. per sq. in. Obviously, the velocity of the spray was terrific, and the friction of the fuel particles penetrating the hot, dense air charge literally wears the fuel particles away before they can reach the opposite side of the combustion chamber. This was proven by experiments carried on in a glass chamber filled with air at different densities. Where the spray had a penetration of over three feet in the atmosphere and would condense on a cold plate at that distance, under 600 lb. pressure it penetrated only three inches and had the appearance of a puff of smoke.

Contrasted with atomization of this sort is the spray from a carburetor nozzle for this size cylinder which is really not a spray at all but a solid stream of liquid separating into large and distinctly visible globules which vaporize slowly in spite of heat absorbed during the compression stroke.

All arguments aside, the proof of the pudding is in the eating. In Germany small Diesels have been built that will run at speeds varying from between 50 and 3000 r.p.m., burning the fuel with characteristic economy through the entire range. Readers are also familar with the Maybach aircraft Diesel operating consistently at 1300 r.p.m. Personally I have known vaporization and combustion to take place so rapidly in certain test engines as to cause detonation severe enough to blow the cylinder head off; probably the fuel underwent a "cracking" process during vaporization.

As to the public's objection to odorous fuels—the fuels are usually kept in tanks, but even if they were not, the heavier fuels would not evaporate at ordinary temperatures while gasoline will and, in addition, is seldom classified as a perfume. If the odors resulting from combustion are meant, it is evident that the products of combustion of all hydrocarbons are the same in character and differ only in proportions.

However, there are some very good reasons why the Diesel is not more popular, some of them being: The high average piston and bearing pressures, the high and localized temperatures, difficulty in maintaining such high compressions in the hands of the average operator and, above all these, the difficulty of accurately measuring and injecting the minute quantities of fuel required for part load operation of small units. All the difficulties are structural, and fundamentally the Diesel cycle is ideally suited to automotive work.

My own opinion is that the Diesel will become much more popular for use in tractors, trucks and even buses (especially if an electric or hydraulic transmission is fitted); in fact wherever fuel economy is a major factor and it is convenient to use a fairly large unit cylinder size, because, after all is said and done, 50 per cent more mileage on fuel costing only one-seventh as much is quite a powerful argument.

R. WAGNER HAUTZENROEDER.

---

## The Automotive Engineer

*Editor* AUTOMOTIVE INDUSTRIES:

The Forum refers to the automobile engineer—Is He Falling Down on the Job?—"We still have with us engines that waste 95 per cent of the gasoline fed to them." "Gadgets and doodads appeal more." A cigar lighter or vanity box, or a new design of knot or some other talking point for a salesmen.

Why should this be? Is the automobile engine capable of doing better while it is fundamentally defective, due to an obsolete control?

Suppose a steam locomotive were controlled by a throttle in the same way as an automobile engine is; the result would be similar as to mean effective pressure, but relatively the locomotive would be more efficient while throttled, assuming a fixed cutoff were used. The locomotive would

use less steam on light loads, and be the same as it is now when bringing up a train to speed.

The automobile engine is admittedly most efficient on open throttle and less efficient on throttled loads. When throttled, operating at a lower compression, a larger fuel ratio is supplied, and besides, application of a potential brake (due to throttling) absorbs power that is said to be equal to the power delivered at the road wheels.

A throttle on a locomotive is used to start and stop a train, but the speed of a train is controlled by a cutoff operating with a wide open throttle on a level and even on a grade.

The other great transportation power unit, a marine engine, is controlled and handled by a throttle while leaving or entering a harbor, but it is operated and controlled by a cutoff set to develop the power necessary to maintain a scheduled speed with a wide open throttle. This means efficiency.

Is the automobile engineer falling down on the job? Yes. The auto engine is an economic failure when operating in cities. Any person operating a conveyance weighing 3000 lb. to transport 160 lb. had better take a street car weighing 30,000 lb. and hauling a load of 7,000 lb. Ninety-five per cent of the fuel wasted, due to the use of a throttle, abandoned for the same reason, is it not?

### Causes Crankcase Dilution

Crankcase oil dilution is largely due to throttling on light loads, and at controls in traffic the condition is even worse.

What is the remedy? A fundamental change in engine control—and the proof has appeared in the journals quite often, but the automobile engine designer seems content to continue this economic waste.

There are several reasons why a change is justified. Perhaps the instances cited as to the two great transportation problems bear a lesson. Super-power plants are necessary to economy. No one can afford to operate a private light plant in cities, and most people can't afford to operate an automobile in the city.

JAMES MCINTOSH.

## Aviators' Beacon

*Editor* AUTOMOTIVE INDUSTRIES:

In your Dec. 10 issue of AUTOMOTIVE INDUSTRIES there is an article describing the flashing beacon to be placed on the top of the building of the Atlantic Refining Co. in Philadelphia. In this article the statement is made that this beacon is to be the first aviator's flashing beacon to be installed by a civilian organization. This statement is not correct inasmuch as New York University, a privately endowed institution, has had such a beacon in operation for the past seven months.

The flashing beacon at New York University is placed on the top of a one hundred and forty foot flag pole which was formerly the mast of Sir Thomas Lipton's cup challenger, the Shamrock IV. This mast is located on a hill, (the site of Fort Number Eight used during the Revolutionary War) overlooking the Harlem River. It is several hundred feet back from the Harlem River, about a mile from the Hudson River, and about a mile from the northern end of Manhattan Island. It is near enough to the Hudson to act as a guide to pilots flying down the Hudson Valley toward New York City.

The beacon, a conventional aviation type, starts flashing each night soon after sundown and continues to flash five seconds on and five seconds off throughout the night. Due to its 2,000 watt bulb, eleven inch lens, and to its height of 335 feet above sea level, it has a range of from twenty-five to thirty miles.

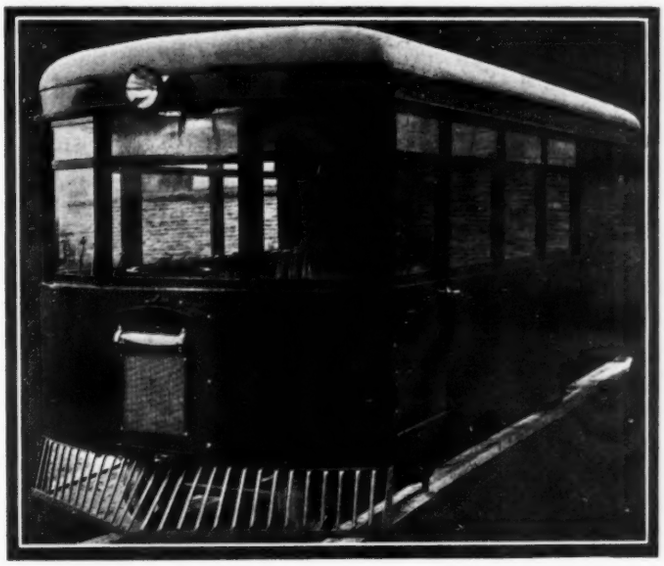
ERWIN H. HAMILTON.

## Rail Car With Ford Engine

A FOURTEEN-PASSENGER gasoline rail car, powered with a Ford model T engine, has been built by the Meister Co., of Sacramento, for the Nevada Central Railroad. It has been designed to carry a full passenger load and 1000 lb. of express or baggage up a two per cent grade at a speed of 14 m. p. h.

Frame material is hot riveted structural steel. Floor is ¾ in. pine. Side panels are ⅜ in. metal fastened to ash posts. Roof is covered with 10 oz. seamless duck. All windows except those in the doors are adjustable vertically. Spring cushioned seats are covered with Spanish leather. Lighting equipment consists of four 10 c. p. marking lamps, one 100 c. p. headlamp, two 10 c. p. dome lamps in the passenger compartment and one in the baggage compartment.

The car is equipped with a turntable made of channel steel and suspended from the frame so that the car may be jacked up and locks installed under the turntable to turn



*Gasoline rail car built by Meister Co. for Nevada Central R. R.*

the car. A chrome nickel steel front axle is used while the rear is Ford truck type with worm gear and Ruckstell axle auxiliary.

Driving wheels are 33 in. diameter while pony truck wheels are 18 in. All wheels are equipped with self aligning ball bearings. The radiator is rectangular with Modine Spirex type pump circulation of cooling water.

---

TAYLOR underfeed stokers are being installed at the plant of Dodge Brothers, Inc., Detroit, under four boilers of 1,287 hp. each. In the case of the furnaces fired by two of the stokers, the air required to support combustion will be preheated by the heat of the gases passing up the stack. This is said to not only recover heat that would otherwise be wasted but also to greatly improve the combustion of the coal, so that practically no unburned fuel is lost with the ashes.

# New Process is Developed for Cleaning Metal Body Surfaces

**Recently perfected compound is sprayed on with gun and drops off when dry, bringing grease, rust and dirt with it. Greater safety and economy among advantages. Alcohol bath at finish.**

*By Walter L. Carver*

A MARKED change in the process of cleaning the metal surfaces of bodies, before the finishing operations, is accomplished by the new Pamco cleaning compound made by the Rex Products and Manufacturing Co. of Detroit. The new cleaner, which is applied with a spray gun, results in a high degree of safety, reduces the total cost of the cleaning operation and produces an excellent degree of cleanliness. The Rex organization has been one of the leading suppliers of a phosphoric acid and alcohol type of cleaner which is used largely at present and its development of the new compound was based primarily on the proposition of eliminating the guesswork and danger of its earlier material.

The use of the new cleaner shows several outstanding advantages:

1. The cleaner is applied with a spray gun to form a black coat. Any spots which have been missed are apparent immediately.
2. Hazard to employees is entirely eliminated.
3. At the end of the cleaning routine the cleaner is removed entirely and leaves bare, clean metal.
4. Grease, oil, rust, soldering flux and dirt are absorbed or included and removed.
5. Panels coated with transparent varnish, which is placed over a surface cleaned with Pamco, withstand a fadeometer test for periods much longer than those cleaned by the method used at present.
6. While the material is more expensive and the unit cost per body is higher, the saving in labor and the elimination of rubber glove expenditure offset the increase and produce a net saving in cleaning cost which, it is claimed, may run as high as 30 per cent.

Ingredients of the new cleaner are sienna, powdered charcoal, methyl-ethyl ketone and phosphoric acid, which form a liquid of about the viscosity of priming paste and which can be sprayed with the usual spray gun equipment and 20-30 pounds air pressure with no further dilution. A pressure tank equipped with an agitator is recommended with the use of the spray gun.

In the composition of the cleaner, sienna is an earth which contains iron and manganese oxides. This material weights the liquids to prevent sagging and to give body to the applied material, acting to some extent as the zinc or lead in paints. Powdered charcoal produces the friable and absorbent properties which will be discussed with the routine of cleaning. Methyl-ethyl ketone is an oil solvent. Phosphoric acid is the active rust-removing and cleansing agent.

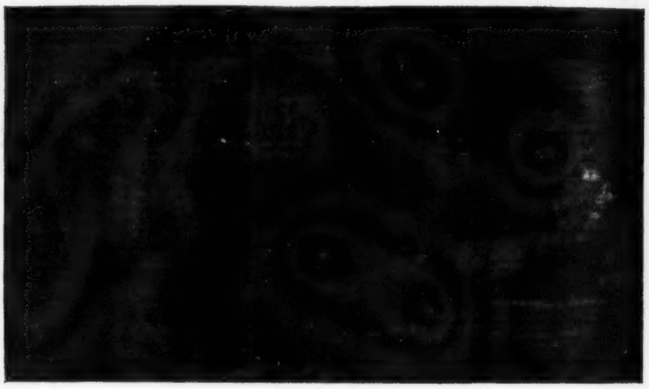


*Fig. 1. Test panel which was cleaned by the existing cleaning methods, coated with clear varnish and subjected to 500 hr. fadeometer test. Note breakdown of surface.*

In the production routine bodies are brought to the cleaning line from the assembly line. Where a considerable interval exists between these two operations, another cleaner, or rather seal, designated as Pamco No. 1 is applied. This compound contains more of the solvent than No. 2, which is the subject of this article. Also the charcoal content is decreased in the No. 1 compound. As the bodies leave the assembly line, the No. 1 compound is brushed on and quickly forms a hard black coating which prevents any further rusting action and serves as seal for periods of indefinite length.

In any case, the procedure at the beginning of the assembly line is identical. Pamco No. 2 is sprayed on with the equipment discussed previously. As sprayed, the material shows no tendency to sag. Following the completion of the spraying operation a period of at least ten minutes should elapse before the body enters a drying oven. This interval is allowed to permit rapid action of the cleaning element in the wet state and the penetration of the minute pores of the metallic surface. At the end of this ten minute interval, the body should be placed in the usual oven heated to a temperature of 150-200 deg. F. and allowed to remain there for at least 10 minutes. The oven equipment used for pyroxylin enamels, consisting of a composition board enclosure heated by steam coils, is very satisfactory.

### Bubbles and Drops Off

In the presence of this temperature, the acid or cleaning action is stimulated for a short period before the drying action is completed by the balance of the time in the oven. As the cleaner dries thoroughly, the friable characteristics of the charcoal content come into play. Where the grease

on the body is thick, the cleaner film raises up in a bubble and finally drops off. Where the body is fairly clean or contaminated by soldering flux, the cleaner film shrinks and curls up and then drops off. As these portions of the film or coat drop off, they carry with them all of the dirt, rust, grease and flux and leave an absolutely clean surface which is free from powdery residue.

Usually about 85 per cent of the cleaner film drops off in the progress through the oven and out to the next station. If the film sprayed on in the first cleaning operation is too thin, this labor saving action is impeded. The thicker the film, the more readily the flaking or friable action occurs. The film both expands and contracts in the drying process. Where oil and grease are absorbed, their addition expands the drying film. Where solids such as rust, flux, etc., are picked up, the film shrinks.

*Fig. 2. Similar panel cleaned with Pamco, coated with similar varnish and given 1000 hr. test. No breakdown in the surface has occurred.*

At present manual labor is utilized for the removal of the small patches of film which remain after the body leaves the oven. Sandpaper and steel wool are used with great success and experiments with electrically driven fibre brushes have shown great promise. The development of a long rotary brush which will sweep down the sides of the body as it passes along the line is anticipated and has reached the point where marked additional labor savings can be promised. The removal of these patches is not a tedious operation, as the flaky characteristics of the cleaner film facilitate the cleaning out of corners, etc. In case any of the cleaner remains under the edges of beads, etc., no further damage can occur as the heat of the oven drying neutralizes any residue.

### Body Given Alcohol Bath

Following the thorough removal of the cleaner, the body is given an alcohol bath and then is wiped dry. In this condition, the body is thoroughly clean with a neutral surface and ready for the finishing operations. Two chief advantages over the usual hot water or steam bath are advanced for the alcohol bath. First, the boiling water or steam may get into the inside of composite bodies and affect the wood frame. Second, no matter how clean the body may be after passing through the wet cleaning method in present use, discoloration always follows the hot water or steam bath. This characteristic yellow bloom is recognized by all finishers and in the last analysis is incipient rust. The use of alcohol is followed by neither of these difficulties.

When the body passes through the Pamco treatment, the metal has the dull silver or satin finish which is associated with etching. That an effect of this nature is present is demonstrated by examination of the streaks formed by soldering acid. This acid attacks the original metal to a greater degree than phosphoric acid, which is the active agent in the cleaner. Consequently when the body leaves the final stage of the cleaning operation, the original streaks show brightly but are surrounded by a satin surface, indicating complete removal and neutralization.

The makers of Pamco assert that the hot water wash which is part of most of the cleaning schemes of today is the greatest drawback to the possibility of a complete nitro-cellulose lacquer finish. Incipient rust is incipient oxide of iron and therefore must be covered with oil primer which has an iron oxide base. The succession of primer and undercoats must cover the metal entirely and then be thoroughly oxidized in themselves to permit the successful application of lacquer.

### Leaves Good Base for Lacquer

With the new cleaner the metal is said to be left entirely clean and neutral and in a slightly etched condition which makes a good base for the immediate application of lacquer. That these claims are reasonable is demonstrated by two tests. If a dirty panel cleaned by the present wet method is dipped in a water bath and then raised and allowed to drain, breaks in the water film will be noted. This is the water break test which is familiar to all metal platers and the break in the film is a sure indication of grease on the surface. Wherever the film breaks, grease is present although invisible. On the other hand similar panels cleaned by the Pamco process invariably show no break in the water film when passed through the same test.

Figs. 1 and 2 present a graphic story of the second test. Fig. 1 is a sheet metal panel which was cleaned by the usual wet method and then coated with clear varnish. When the varnish was dry, the panel was subjected to a fadeometer test which involved a routine of successive exposures to ultra-violet light, water spray, water bath and darkness. At the end of 500 hours the surface had broken down as shown. Fig. 2 shows a similar panel cleaned by the Pamco method and coated with the same varnish. After more than 1000 hours' exposure to the same routine, the test was discontinued as no breakdown was indicated other than the slight incursion of rust around one edge, which was not chargeable to the cleaning process or the varnish but to the fact that the back of the panel was not cleaned. This is a perfectly natural process and, incidentally, emphasizes the necessity for checking the condition of the inside of the body. Rust near the border between the inside and outside of the body will work its way around to the outer surfaces in spite of every precaution in cleaning the outer surfaces. Any finish is deposited upon the surface of the metal whereas the oxidation or rusting is a process which occurs within the limits of the metal and therefore will undermine the finish.

---

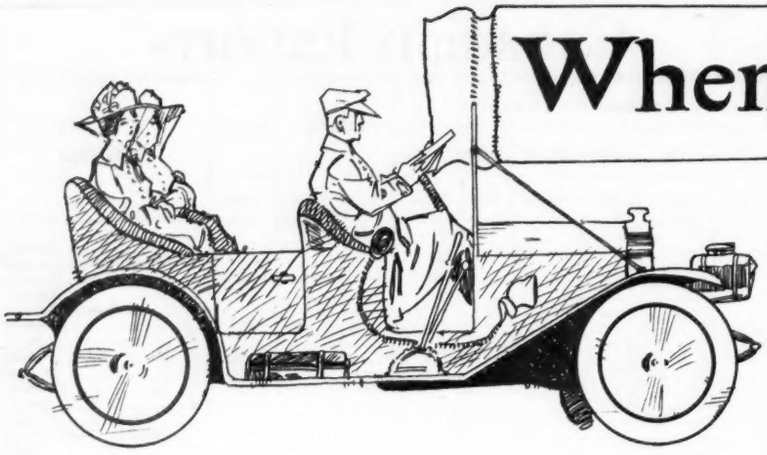
THE British Power Alcohol Association is continuing its effort to obtain a subsidy from the Government for power alcohol. The latest suggestion is that the Government limit the proposed subsidy to the production of, say, 3,000,000 gallons of power alcohol per annum for the first three years of the subsidy period, and that six months before the expiry of the three years a committee of experts should be appointed to examine the results of the working of those beet distilleries then established before committing itself to extend the subsidy to further distilleries.

# Exports of Cars, Trucks, Tires and Parts

| COUNTRIES | GASOLINE PASSENGER CARS | | | | | | | | | | TRUCKS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Up to $500 | | $500 to $800 | | $800 to $1,200 | | $1,200 to $2,000 | | Over $2,000 | | Up to 1 ton | | 1 to 2½ Tons | | Over 2½ Tons | |
| | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value |
| Austria | | | 5 | $3,428 | | | 1 | $1,361 | | | | | | | | |
| Azores and Madeira Islands | 6 | $2,393 | 1 | 658 | 2 | $2,140 | 1 | 1,357 | | | 1 | $404 | | | | |
| Belgium | 192 | 76,937 | 148 | 111,769 | 213 | 232,109 | 50 | 76,684 | 13 | $37,859 | 720 | 301,041 | | | 1 | $2,031 |
| Bulgaria | | | | | 3 | 3,337 | | | | | | | | | | |
| Czecho Slovakia | | | | | | | | | | | | | | | | |
| Denmark | 144 | 69,160 | 131 | 102,623 | 72 | 75,228 | 8 | 12,647 | 1 | 3,579 | 528 | 221,586 | 4 | $5,597 | | |
| Esthonia | | | | | 2 | 2,166 | 1 | 1,683 | | | | | | | | |
| Finland | | | 1 | 809 | 24 | 24,228 | 7 | 11,325 | 6 | 15,274 | 2 | 1,624 | 4 | 4,748 | | |
| France | | | 4 | 2,668 | 79 | 85,135 | 12 | 19,748 | 2 | 8,837 | | | | | | |
| Germany | 1 | 250 | 173 | 145,070 | 263 | 285,496 | 39 | 61,956 | 11 | 31,751 | | | 1 | 1,011 | | |
| Greece | | | | | 4 | 4,447 | 1 | 1,405 | 2 | 5,000 | | | | | 1 | 3,104 |
| Hungary | | | | | | | | | | | | | | | | |
| Iceland and Faroe Islands | | | | | | | | | | | | | | | | |
| Italy | 373 | 117,865 | | | 3 | 3,171 | | | | | 461 | 119,385 | | | | |
| Latvia | | | | | 1 | 1,037 | | | | | | | | | | |
| Lithuania | | | 1 | 700 | | | | | | | | | | | | |
| Malta, Gozo and Cyprus Is. | 24 | 8,496 | | | 4 | 4,278 | | | | | | | | | | |
| Netherlands | | | 51 | 37,793 | 66 | 71,407 | 23 | 38,463 | 18 | 53,333 | 1 | 1,181 | 12 | 15,228 | | |
| Norway | 4 | 1,790 | 6 | 4,744 | 20 | 19,314 | 8 | 10,854 | 1 | 2,729 | | | 7 | 8,300 | | |
| Poland and Danzig | | | 5 | 3,655 | 4 | 4,316 | | | | | | | | | | |
| Portugal | 7 | 3,066 | 14 | 11,302 | 10 | 10,873 | 6 | 9,617 | 1 | 2,500 | 27 | 11,189 | 2 | 1,484 | | |
| Rumania | | | 23 | 18,282 | 20 | 21,198 | 11 | 15,079 | | | | | | | | |
| Russia | | | 19 | 13,584 | | | | | 2 | 5,501 | | | | | | |
| Spain | 55 | 26,663 | 165 | 130,018 | 180 | 188,648 | 75 | 111,410 | 11 | 30,217 | 68 | 34,124 | 5 | 5,615 | | |
| Sweden | | | 54 | 43,960 | 165 | 176,972 | 13 | 20,559 | 6 | 15,000 | 4 | 3,419 | 6 | 6,406 | | |
| Switzerland | | | 4 | 2,729 | 17 | 18,680 | 23 | 35,409 | 19 | 47,500 | | | | | | |
| Turkey | | | | | 3 | 3,042 | 6 | 8,257 | | | | | | | | |
| United Kingdom | 288 | 132,642 | 109 | 88,305 | 103 | 95,551 | 24 | 39,108 | 10 | 28,993 | 390 | 166,908 | 41 | 64,037 | 6 | 13,510 |
| Irish Free State | 1 | 275 | 6 | 5,064 | 3 | 3,094 | | | | | 4 | 2,570 | 4 | 4,613 | | |
| Yugoslavia | | | 2 | 1,429 | 6 | 6,814 | 3 | 4,513 | 1 | 3,735 | | | | | | |
| United States | | | | | | | | | | | | | | | | |
| British Honduras | 1 | 400 | | | | | 1 | 1,270 | | | | | | | | |
| Canada | 131 | 36,042 | 191 | 123,232 | 193 | 195,197 | 103 | 174,835 | 43 | 102,737 | 21 | 15,860 | 68 | 83,906 | 12 | 28,157 |
| Costa Rica | | | 8 | 5,766 | 3 | 3,024 | 1 | 1,450 | | | | | 2 | 2,370 | 1 | 1,645 |
| Guatemala | 6 | 2,232 | 10 | 7,878 | 13 | 14,057 | 9 | 14,489 | 6 | 16,000 | 2 | 2,629 | 5 | 8,682 | | |
| Honduras | | | | | 1 | 950 | | | | | | | | | | |
| Nicaragua | 2 | 750 | 8 | 5,787 | 5 | 5,535 | 1 | 1,332 | | | | | | | 4 | 22,499 |
| Panama | 14 | 5,874 | 5 | 3,446 | 18 | 18,251 | | | 2 | 4,524 | 3 | 4,080 | 5 | 18,037 | | |
| Salvador | | | 13 | 10,555 | 11 | 13,069 | 9 | 13,336 | 5 | 12,500 | | | 3 | 3,634 | 6 | 14,775 |
| Mexico | 845 | 250,793 | 156 | 107,170 | 243 | 250,332 | 31 | 47,172 | 38 | 101,540 | 371 | 134,892 | 34 | 44,106 | 5 | 19,837 |
| Miquelon | | | 3 | 2,352 | | | | | | | | | | | | |
| Newfoundland | | | 1 | 644 | 1 | 1,151 | 1 | 1,585 | | | | | | | | |
| Barbados | 3 | 1,080 | | | 6 | 6,396 | | | | | | | | | | |
| Jamaica | 24 | 9,442 | 30 | 21,088 | 23 | 24,418 | 4 | 5,608 | | | | | 7 | 12,674 | 2 | 4,448 |
| Trinidad and Tobago | 16 | 7,593 | 2 | 1,611 | 7 | 7,475 | 3 | 4,363 | | | | | 1 | 850 | | |
| Other British West Indies | 18 | 6,998 | 4 | 2,929 | 4 | 4,283 | 2 | 2,799 | 1 | 3,500 | 8 | 3,943 | 3 | 3,780 | | |
| Cuba | 418 | 162,825 | 74 | 54,645 | 78 | 81,810 | 23 | 33,310 | 42 | 115,065 | 137 | 63,548 | 15 | 20,902 | 21 | 42,120 |
| Dominican Republic | 76 | 31,042 | 8 | 5,860 | 13 | 13,949 | 10 | 14,787 | 9 | 22,892 | 5 | 3,083 | 4 | 8,412 | 2 | 5,078 |
| Dutch West Indies | 1 | 360 | 6 | 4,645 | 14 | 15,053 | | | 1 | 2,500 | 1 | 352 | 1 | 1,315 | | |
| French West Indies | 1 | 496 | | | | | | | | | | | | | | |
| Haiti | 2 | 386 | 4 | 2,825 | 6 | 6,592 | 4 | 5,613 | | | 1 | 758 | 1 | 1,254 | 1 | 1,627 |
| Virgin Islands | 4 | 1,638 | | | | | | | | | | | | | | |
| Argentina | 3,282 | 1,512,750 | 891 | 622,533 | 532 | 548,675 | 137 | 203,332 | 76 | 197,587 | 325 | 142,543 | 43 | 74,989 | 28 | 96,776 |
| Bolivia | | | 2 | 1,201 | 3 | 3,100 | | | | | | | 13 | 18,075 | | |
| Brazil | 801 | 303,689 | 135 | 100,963 | 349 | 363,443 | 92 | 130,579 | 16 | 42,351 | 296 | 128,543 | 17 | 18,919 | | |
| Chile | 19 | 7,990 | 11 | 8,794 | 18 | 19,110 | 9 | 13,453 | 4 | 10,774 | 265 | 71,310 | 27 | 54,528 | 1 | 4,200 |
| Colombia | 71 | 28,269 | 51 | 35,323 | 20 | 20,550 | 16 | 24,748 | 4 | 11,363 | 31 | 16,379 | 29 | 44,037 | 2 | 5,878 |
| Ecuador | 13 | 4,426 | | | | | | | | | | | | | | |
| British Guiana | | | | | 2 | 1,948 | | | | | | | | | | |
| Dutch Guiana | | | | | | | | | | | | | | | | |
| Paraguay | | | | | | | | | | | 6 | 2,216 | | | | |
| Peru | 39 | 15,093 | 5 | 4,228 | 26 | 27,010 | 1 | 1,567 | 3 | 8,252 | 18 | 12,162 | 27 | 39,465 | 1 | 5,175 |
| Uruguay | 347 | 101,802 | 62 | 51,053 | 60 | 63,605 | 11 | 15,712 | 12 | 44,530 | 150 | 38,845 | | | 5 | 11,887 |
| Venezuela | 55 | 20,982 | 28 | 23,126 | 79 | 81,157 | 22 | 31,294 | 6 | 18,361 | 61 | 26,680 | 23 | 34,343 | 3 | 15,388 |
| Aden | 4 | 1,967 | 1 | 552 | | | | | | | | | | | | |
| British India | 23 | 11,212 | 123 | 100,963 | 96 | 101,098 | | | | | 151 | 109,205 | 19 | 23,262 | | |
| Ceylon | | | 4 | 3,154 | 3 | 3,210 | 2 | 2,829 | | | 10 | 7,974 | 11 | 14,511 | 2 | 2,500 |
| Straits Settlements | 33 | 16,240 | 141 | 101,155 | 100 | 100,467 | 2 | 2,949 | | | | | 3 | 5,032 | 2 | 2,447 |
| China | 75 | 27,740 | 15 | 10,718 | 24 | 25,457 | 2 | 2,810 | 1 | 2,500 | 26 | 11,621 | 11 | 15,434 | 1 | 1,248 |
| Chosen | | | | | | | | | | | | | | | | |
| Java and Madura | | | 61 | 46,775 | 50 | 49,833 | 9 | 14,984 | 9 | 22,500 | 5 | 3,752 | 14 | 15,946 | 2 | 4,460 |
| Other Dutch East Indies | | | 14 | 9,760 | 16 | 16,491 | 2 | 3,030 | 1 | 2,216 | | | 9 | 10,486 | | |
| French Indo China | | | | | | | | | | | | | | | | |
| Hejaz, Arabia and Iraq | 22 | 7,172 | | | | | | | | | | | | | | |
| Hongkong | | | | | | | 1 | 2,000 | | | | | 2 | 2,619 | 2 | 15,300 |
| Japan | 5 | 1,000 | 15 | 11,556 | 95 | 105,961 | 15 | 23,245 | 16 | 41,761 | 6 | 962 | 3 | 2,700 | | |
| Kwangtung | 36 | 10,850 | 7 | 4,391 | 7 | 7,530 | 1 | 1,223 | | | 55 | 16,794 | | | | |
| Palestine and Syria | 60 | 21,600 | 35 | 35,822 | 38 | 36,923 | 3 | 4,921 | | | 3 | 2,833 | | | | |
| Persia | 1 | 492 | | | | | | | | | | | | | | |
| Philippine Islands | 175 | 69,117 | 56 | 34,682 | 57 | 58,084 | 6 | 10,237 | 10 | 27,305 | 73 | 28,031 | 21 | 27,310 | 6 | 13,100 |
| Siam | | | 10 | 7,071 | | | | | | | | | | | | |
| Turkey | | | | | | | | | | | | | | | | |
| Australia | 1,010 | 366,000 | 1,202 | 850,110 | 919 | 1,014,316 | 110 | 171,129 | 16 | 42,451 | 1,683 | 800,046 | 192 | 214,679 | 30 | 81,350 |
| New Zealand | 210 | 102,373 | 135 | 94,598 | 308 | 334,632 | 51 | 77,098 | 2 | 4,970 | 74 | 50,297 | 38 | 43,752 | 4 | 11,045 |
| British Oceania | | | | | 7 | 6,334 | | | | | | | 1 | 999 | | |
| French Oceania | 1 | 175 | 1 | 650 | | | | | | | 2 | 985 | | | | |
| Other Oceania | | | | | | | | | | | 1 | 260 | | | | |
| Belgian Congo | 3 | 1,056 | 2 | 1,516 | 1 | 1,132 | | | | | 3 | 840 | | | | |
| British West Africa | 1 | 400 | 2 | 1,317 | 8 | 8,798 | | | | | 15 | 17,451 | 133 | 135,461 | | |
| British South Africa | 77 | 35,231 | 212 | 159,481 | 993 | 1,064,744 | 23 | 37,197 | | | 10 | 10,243 | 41 | 47,325 | 1 | 3,600 |
| British East Africa | 15 | 6,485 | 6 | 4,644 | 21 | 23,682 | 4 | 4,800 | | | 114 | 63,961 | 3 | 6,038 | 1 | 3,627 |
| Canary Islands | | | 6 | 5,113 | 4 | 4,216 | 1 | 1,333 | | | | | 1 | 1,395 | | |
| Egypt | 20 | 7,200 | 8 | 5,509 | 37 | 38,422 | 1 | 1,332 | 1 | 2,729 | 1 | 758 | | | | |
| Algeria and Tunis | | | 1 | 803 | 1 | 1,048 | 8 | 12,286 | | | | | | | | |
| Other French Africa | 37 | 12,521 | 10 | 6,658 | 3 | 2,455 | | | | | 55 | 20,634 | 18 | 16,864 | | |
| Italian Africa | | | | | | | | | | | | | 8 | 7,873 | | |
| Liberia | 1 | 506 | | | | | | | | | | | | | | |
| Morocco | 43 | 14,996 | 6 | 4,817 | 1 | 1,014 | 2 | 2,702 | | | 20 | 8,080 | 1 | 1,258 | | |
| Portuguese East Africa | 4 | 1,548 | 3 | 2,358 | 19 | 22,210 | | | | | | | | | | |
| Other Portuguese Africa | 1 | 125 | 31 | 25,715 | 2 | 2,219 | | | | | | | 2 | 1,837 | | |
| Spanish Africa | | | 2 | 1,565 | | | | | | | 2 | 928 | | | | |
| TOTAL | 9,141 | $3,668,495 | 4,739 | $3,467,697 | 5,805 | $6,163,097 | 1,045 | $1,600,174 | 428 | $1,152,716 | 6,216 | $2,686,909 | 945 | $1,206,098 | 153 | $436,812 |

# for November, 1925 | Canadian Exports

| ELECTRIC VEHICLES | | PARTS | TIRES | | | | | | PASSENGER CARS | | | | | | TRUCKS | | PARTS | COUNTRIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Casings | | Inners | | Solids | | Up to $500 | | $500 to $1,000 | | Over $1,000 | | | | | |
| No. | Value | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | No. | Value | Value | |
| | | $772 | 25 | $519 | 10 | $60 | 20 | $1,087 | | | | | | | | | $989 | Austria |
| | | 3,370 | 6 | 124 | | | | | | | | | | | | | | Azores and Madeira Islands |
| | | 232,410 | 892 | 30,024 | 676 | 3,871 | | | | | 5 | $4,532 | 17 | $25,881 | | | 39,195 | Belgium |
| | | | 10 | 289 | | | | | | | | | | | | | | Bulgaria |
| | | 1,966 | 631 | 14,266 | 490 | 1,643 | 81 | 3,046 | | | | | | | | | | Czecho Slovakia |
| | | 298,352 | 1,563 | 32,500 | 1,550 | 3,761 | 67 | 1,769 | | | | | 12 | 16,740 | | | 17,879 | Denmark |
| | | 562 | 30 | 2,336 | 30 | 316 | | | | | | | | | | | | Esthonia |
| | | 4,717 | 531 | 16,100 | 761 | 2,510 | | | | | 10 | 7,609 | 5 | 5,720 | | | | Finland |
| | | 190,252 | 5,653 | 79,572 | 4,347 | 14,905 | 10 | 227 | | | 8 | 6,787 | | | | | | France |
| | | 45,371 | 842 | 27,998 | 1,512 | 5,896 | 8 | 307 | | | 5 | 4,412 | 36 | 54,642 | | | | Germany |
| | | 10,912 | 1,034 | 18,377 | 1,186 | 3,762 | 185 | 11,390 | | | | | | | | | | Greece |
| | | 827 | | | | | | | | | | | | | | | | Hungary |
| | | 980 | | | | | | | | | | | | | | | | Iceland and Faroe Islands |
| | | 71,944 | 479 | 6,398 | 288 | 785 | 14 | 432 | | | | | | | | | | Italy |
| | | | | | 60 | 141 | | | | | | | | | | | | Latvia |
| | | 596 | 2 | 36 | | | | | | | | | | | | | | Lithuania |
| | | 831 | 6 | 63 | 12 | 22 | | | 5 | 2,168 | | | | | 2 | $864 | | Malta, Gozo and Cyprus Is. |
| 1 | $1,525 | 68,922 | 1,339 | 30,418 | 1,405 | 5,228 | 12 | 354 | | | | | | | | | | Netherlands |
| | | 14,598 | 954 | 26,178 | 735 | 1,753 | 20 | 1,135 | 4 | 1,368 | | | 3 | 3,679 | | | 7 | Norway |
| | | 1,607 | 170 | 2,513 | 313 | 689 | | | | | | | | | | | | Poland and Dantzig |
| | | 5,625 | 335 | 5,485 | 476 | 1,132 | 48 | 2,578 | | | | | 1 | 1,311 | | | | Portugal |
| | | 8,632 | 60 | 974 | 18 | 79 | | | 41 | 17,097 | 7 | 4,175 | 2 | 2,636 | 10 | 4,168 | | Rumania |
| | | 17,537 | 138 | 2,951 | 46 | 153 | | | | | | | 2 | 2,514 | | | | Russia |
| | | 113,647 | 3,566 | 71,281 | 3,162 | 11,497 | 1,072 | 36,992 | | | | | 82 | 124,240 | | | 105 | Spain |
| | | 75,311 | 1,832 | 36,696 | 1,985 | 3,894 | 7 | 526 | | | 2 | 1,654 | 7 | 9,326 | | | 9 | Sweden |
| | | 9,188 | 147 | 9,244 | 137 | 889 | | | | | | | | | | | | Switzerland |
| | | 7,212 | 80 | 1,224 | 190 | 525 | | | 3 | 1,281 | 1 | 548 | 7 | 9,928 | 2 | 834 | | Turkey |
| | | 343,891 | 11,116 | 150,259 | 5,756 | 15,695 | 1,864 | 52,603 | | | 454 | 415,240 | 172 | 216,801 | 1 | 1,959 | 38,946 | United Kingdom |
| | | 46,379 | 10 | 116 | 60 | 84 | | | | | | | | | | | 152 | Irish Free State |
| | | 940 | | | 440 | 2,775 | | | | | | | | | | | | Yugoslavia |
| | | 424 | 14 | 150 | 16 | 79 | | | 16 | 2,280 | 3 | 1,850 | 1 | 1,004 | 8 | 3,950 | 71,482 | United States |
| | | 1,575,601 | 1,961 | 43,280 | 1,757 | 4,001 | 146 | 4,908 | | | | | | | | | | British Honduras |
| | | 1,463 | 301 | 6,915 | 197 | 671 | 6 | 144 | | | | | | | | | | Canada |
| | | 8,502 | 100 | 2,120 | 453 | 1,521 | | | | | 2 | 1,759 | 5 | 6,427 | 8 | 3,140 | | Costa Rica |
| | | 1,157 | 136 | 2,518 | 70 | 148 | | | | | 1 | 879 | | | | | 14 | Guatemala |
| | | 1,807 | 110 | 1,114 | 58 | 129 | 4 | 140 | | | | | 1 | 1,223 | | | | Honduras |
| | | 16,243 | 1,392 | 25,051 | 612 | 1,930 | 10 | 526 | | | | | 3 | 3,803 | | | | Nicaragua |
| | | 6,299 | 271 | 6,259 | 247 | 956 | 8 | 401 | | | | | 3 | 3,976 | | | | Panama |
| 1 | 100 | 132,924 | 12,419 | 146,279 | 5,087 | 13,823 | 237 | 8,179 | | | 13 | 10,776 | 6 | 7,152 | | | 255 | Salvador |
| | | | | | | | | | | | | | | | | | | Mexico |
| | | 1,479 | 14 | 225 | 6 | 16 | | | 4 | 1,790 | | | | | | | 760 | Miquelon |
| | | 2,219 | 35 | 361 | 50 | 85 | 12 | 227 | 1 | 423 | 6 | 4,662 | 1 | 1,236 | 1 | 330 | 132 | Newfoundland |
| | | 8,797 | 178 | 3,335 | 240 | 534 | 118 | 2,265 | 10 | 3,960 | 1 | 922 | 2 | 2,563 | | | | Barbados |
| | | 7,791 | 106 | 1,856 | 16 | 22 | 14 | 373 | 46 | 16,153 | 6 | 5,119 | 1 | 1,260 | 3 | 1,164 | 162 | Jamaica |
| | | 7,018 | 157 | 3,131 | 173 | 425 | | | 15 | 5,361 | 2 | 1,633 | | | | | 6 | Trinidad and Tobago |
| | | 87,494 | 8,418 | 97,755 | 8,163 | 14,223 | 424 | 15,631 | | | 13 | 11,223 | 19 | 23,964 | | | 198 | Other British West Indies |
| | | 10,960 | 695 | 8,023 | 484 | 1,235 | 6 | 164 | | | 2 | 1,759 | 1 | 1,228 | | | | Cuba |
| | | 2,024 | 142 | 4,441 | 118 | 404 | | | 3 | 1,173 | | | 1 | 1,253 | | | | Dominican Republic |
| | | 2,669 | | | | | 4 | 314 | 4 | 1,682 | | | | | 1 | 432 | | Dutch West Indies |
| | | 4,322 | 185 | 4,429 | 242 | 699 | | | 4 | 1,667 | | | 1 | 1,223 | 10 | 4,168 | 8 | French West Indies |
| | | 1,247 | 18 | 139 | 148 | 277 | | | | | | | | | | | | Haiti |
| | | 588,967 | 7,810 | 114,429 | 6,631 | 16,628 | 381 | 15,233 | 502 | 189,936 | 20 | 17,313 | 22 | 28,383 | | | 196,899 | Virgin Islands |
| | | 3,266 | 343 | 6,665 | 325 | 1,258 | 19 | 597 | | | | | 4 | 6,129 | 16 | 6,670 | 107 | Argentina |
| | | 366,611 | 2,913 | 50,097 | 5,409 | 24 354 | 385 | 13,192 | 3 | 1,230 | | | 15 | 19,087 | | | 70,596 | Bolivia |
| | | 105,340 | 974 | 18,251 | 671 | 1,092 | 75 | 2,198 | 10 | 4,206 | 5 | 3,423 | 8 | 10,876 | 1 | 432 | | Brazil |
| | | 36,228 | 763 | 16,674 | 801 | 4,798 | 40 | 1,879 | | | 4 | 3,531 | 11 | 15,423 | 17 | 7,623 | | Chile |
| | | 1,881 | 36 | 595 | 186 | 622 | 8 | 264 | | | | | | | 10 | 4,169 | | Colombia |
| | | 1,249 | | | | | | | 47 | 15,509 | 5 | 3,742 | | | 1 | 322 | 88 | Ecuador |
| | | 549 | 14 | 101 | 24 | 36 | 5 | 109 | | | | | | | | | | British Guiana |
| | | | 95 | 816 | 420 | 835 | | | 6 | 2,664 | | | | | | | | Dutch Guiana |
| | | 41,788 | 2,229 | 52,647 | 1,516 | 6,174 | 24 | 1,425 | | | | | 4 | 5,245 | | | | Paraguay |
| | | 52,467 | 853 | 11,727 | 808 | 1,888 | 68 | 1,397 | 136 | 57,891 | 2 | 1,120 | 6 | 7,877 | 10 | 4,203 | | Peru |
| | | 22,276 | 2,116 | 19,410 | 1,684 | 5,613 | 16 | 560 | 29 | 13,100 | 2 | 1,767 | 7 | 8,853 | 22 | 9,171 | 1 | Uruguay |
| | | 46 | 23 | 679 | | | 4 | 109 | 14 | 3,948 | | | | | | | 241 | Venezuela |
| | | 56,340 | 1,997 | 30,468 | 6,491 | 12,893 | 254 | 7,329 | 902 | 327,126 | 56 | 40,423 | 21 | 22,648 | 403 | 136,742 | 31,571 | Aden |
| | | 12,060 | 86 | 1,267 | 268 | 1,767 | 5 | 101 | 59 | 21,991 | 5 | 4,021 | 6 | 6,890 | 18 | 5,272 | 9,456 | British India |
| | | 41,836 | 260 | 4,528 | 425 | 1,084 | 99 | 3,025 | 542 | 198,033 | 69 | 51,709 | 12 | 14,684 | 121 | 41,051 | 37,119 | Ceylon |
| | | 31,116 | 2,388 | 27,189 | 1,269 | 3,056 | 34 | 717 | 25 | 10,594 | 13 | 9,216 | 16 | 24,102 | 37 | 16,145 | 235 | Straits Settlements |
| | | 109 | | | | | | | | | | | | | | | | China |
| | | 47,102 | 2,819 | 41,289 | 2,060 | 10,334 | 477 | 18,189 | 820 | 274,671 | 9 | 5,636 | 10 | 12,907 | 207 | 67,679 | 36,030 | Chosen |
| | | 9,507 | 82 | 1,499 | 94 | 259 | | | | | | | | | | | | Java and Madura |
| | | 80 | | | | | | | | | | | | | | | | Other Dutch East Indies |
| | | 2,025 | 1,106 | 17,751 | 1,892 | 5,155 | | | 2 | 862 | | | 5 | 6,262 | 2 | 841 | | French Indo China |
| | | 2,182 | 2 | 27 | 2 | 8 | | | | | | | | | | | | Hejaz, Arabia and Iraq |
| | | 226,067 | 5,796 | 61,518 | 6,870 | 11,191 | 842 | 12,731 | 10 | 3,961 | 2 | 1,200 | 7 | 8,492 | | | 447 | Hongkong |
| | | 435 | | | | | | | | | | | | | | | | Japan |
| | | 10,107 | 595 | 12,210 | 934 | 3,116 | | | 2 | 762 | 2 | 1,827 | 7 | 8,844 | | | | Kwangtung |
| | | 28 | | | | | | | | | | | | | | | | Palestine and Syria |
| | | 77,169 | 2,789 | 31,600 | 2,961 | 9,608 | 327 | 10,706 | | | | | | | | | | Persia |
| | | 1,148 | | | | | | | 17 | 5,721 | 1 | 617 | | | 138 | 45,485 | 7,032 | Philippine Islands |
| | | 606 | | | | | | | | | | | | | | | | Siam |
| | | 264,721 | 5,617 | 94,099 | 4,580 | 16,002 | 991 | 40,476 | 944 | 271,977 | 72 | 38,621 | 8 | 11,567 | 112 | 40,684 | 99,534 | Turkey |
| | | 90,892 | 3,199 | 55,390 | 1,430 | 4,980 | 479 | 22,752 | 945 | 324,725 | 267 | 213,487 | 32 | 36,154 | 255 | 78,252 | 73,019 | Australia |
| | | 1,645 | 8 | 80 | 16 | 28 | | | 7 | 2,018 | | | | | 7 | 1,679 | 606 | New Zealand |
| | | 650 | 2 | 64 | | | 4 | 200 | | | | | | | | | | British Oceania |
| | | 670 | 12 | 222 | | | | | 7 | 2,166 | | | | | 8 | 2,814 | 1,569 | French Oceania |
| | | 1,097 | | | | | | | 4 | 1,620 | | | | | | | | Other Oceania |
| | | 31,724 | 30 | 1,583 | 18 | 54 | | | 37 | 11,265 | 2 | 1,182 | | | 51 | 16,052 | 19,967 | Belgian Congo |
| 3 | 6,150 | 101,155 | 1,255 | 18,031 | 99 | 596 | 65 | 2,112 | 578 | 204,083 | 10 | 7,650 | 3 | 4,903 | 57 | 18,026 | 25,442 | British South Africa |
| | | 9,606 | 844 | 13,602 | 849 | 2,639 | | | 100 | 37,435 | 4 | 3,072 | | | 98 | 36,475 | 15,018 | British East Africa |
| | | 5,438 | 478 | 8,210 | 270 | 637 | 49 | 2,510 | 5 | 2,209 | 5 | 3,621 | | | 4 | 1,681 | | Canary Islands |
| | | 13,602 | 316 | 5,463 | 555 | 1,382 | 150 | 4,238 | 26 | 11,293 | 11 | 9,291 | 5 | 7,049 | 12 | 5,044 | | Egypt |
| | | 40 | | | | | | | | | | | | | | | | Algeria and Tunis |
| | | 7,637 | 30 | 360 | 225 | 550 | | | | | | | | | | | | Other French Africa |
| | | | 120 | 1,754 | 200 | 452 | | | | | | | | | | | | Italian Africa |
| | | 335 | | | | | | | | | | | | | | | | Liberia |
| | | 660 | | | | | | | 16 | 6,512 | | | | | 8 | 3,500 | | Morocco |
| | | 1,701 | | | | | 2 | 20 | 2 | 774 | | | | | 3 | 1,122 | 642 | Portuguese East Africa |
| | | 1,714 | | | | | | | | | | | | | | | | Other Portuguese Africa |
| | | 1,249 | 82 | 937 | 102 | 232 | | | | | | | | | | | | Spanish Africa |
| 5 | 7,775 | $5,730,915 | 106,085 | $1,644,554 | 93,867 | $272,564 | 9,200 | $307,787 | 5,953 | $2,064,685 | 1,107 | $908,008 | 600 | $796,105 | 1,664 | $572,143 | $795,918 | Total |



# When Rubber was

***Many have forgot it ever went cost on New York market 16 there were charges of price servation was urged***

**THIS article isn't designed to prove anything.**

**Everybody in the industry today is talking and thinking about rubber. High prices and insufficient available supply has caused serious problems both to automobile and tire manufacturers.**

**Somewhat the same situation existed about 16 years ago. This story tells what was being said and thought at that time. It is interesting in the light of present conditions to see how far history does or does not repeat itself.**

---

WITH the whole nation talking about high rubber prices as a result of the flurry which sent the cost of crude to $1.10 at New York a month or so ago, many seem to have lost sight of the fact that the present situation is not without its "deadly parallel" in rubber history. There has been so much said and written on the subject in the last few months that the average man in the street thinks $1.10 must be a new high price to pay for one pound of the resiliency which goes into his automobile tires.

It is highly probable that a great many men directly connected with the automobile industry today cannot remember when $1.10 was actually a bargain price for rubber, but it has been only 16 years ago that crude was quoted on the New York market at $3.08 a pound.

So far as can be ascertained, that is the highest price ever paid for rubber in America, but during the time it prevailed several lots in London brought $3.20 a pound. The time was May, 1910.

### When the Industry Was Young

Some highly interesting facts concerning rubber prices, and rubber production and consumption, are brought to light by a perusal of the old files in which are recorded the happenings in rubber in the days when the automotive industry was young—when, for instance, a Ford roadster sold for $900; when there was a total of 21,000 cars registered in Ohio, and when the total production of the industry in the United States was about 55,000 cars a year. The facts are doubly interesting if read in the light of present conditions.

Today we speak of "dollar rubber" but we think of the normal price as being about 35c a pound. It could be bought at that figure in any quantity desired only 12 months ago. There have been times in recent years when it could be bought for much less. The bottom price 24 years ago was around 87c a pound, New York. During the years 1902-04, the price held comparatively steady at from 87c to $1 and that was considered very reasonable. In May, 1905, there was a rise to $1.44. This caused the buyers to complain but they soon became accustomed to the higher price as it continued with few fluctuations for about two years.

In 1907 the periodicals of the day spoke of a "slump" in the price. It fell to $1.12½. Later in the year, in November, it "slumped" again, going down to 83c per pound. This then low price was attributed to two primary causes: (1) The great financial and industrial depression in the United States, which curtailed consumption, and (2) the first appearance in the market of large quantities of plantation rubber.

### Brazil Chief Source of Supply

Up to this time to speak of rubber was to think of Para and Brazil. By far the greater proportion of the world's supply came from the wild forests along the Amazon and found its way to civilization through the port of Para. And in this one fact we have the key to the reason for the high prices which ruled all rubber markets in that day. Harvesting rubber was a most hazardous and expensive undertaking. It was a gamble in which men pitted life against fortune. Anybody who could afford to buy or hire a small river boat was free to organize a rubber-hunting expedition. The jungles were open to anyone. Laborers were recruited from the natives and from the Latin countries of Europe. No expedition ever went up the river and came back intact. Sometimes an entire crew would be lost. Many of the men who organized these expeditions were hardened adventurers and the fewer men they brought back alive the less they had to pay out in wages. It was often figured that way.

In the mad scramble to get the rubber and get back, no attempt was made to tap the trees scientifically. The trees were either drained entirely, thus ruining them or preventing any further yield for at least 20 years, or they were blithely chopped down. Thus every succeeding expedition had to go farther into the country to find good trees and the cost of production always increased.

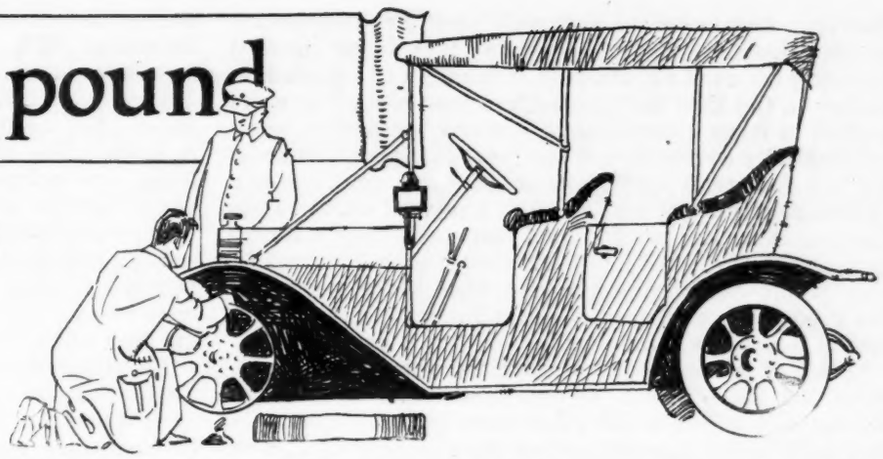
In 1907 the rubber brought out of Brazil was valued at $65,251,287, and was consumed as follows:

| | | | |
|---|---|---|---|
| United States | 16,811 | Metric | Tons |
| England | 14,811 | " | " |
| France | 2,506 | " | " |
| Germany | 2,231 | " | " |
| All other countries | 488 | " | " |
| Total | 36,490 | | |

The high price of rubber which prevailed during this period naturally served as an incentive to cultivate the

# $3.08 per pound

***that high, but that's what it years ago. Then, as now, manipulation and con- by manufacturers.***



plant under civilized conditions and plantations were developed in numerous areas throughout the world. Hence, in 1907 we find 355,000 acres under cultivation, and, surprising as it seems today, the greatest area of all was in Mexico. Today Mexico is almost a negligible factor in rubber production, although it may be heard of again in the future as Harvey B. Firestone has a 35,000-acre project in course of development there and if reasonably high prices should continue it probably will be possible to produce on a profitable basis in competition with Malaya, Ceylon and other areas.

In 1907 the Rubber Planters Association of Mexico, held a meeting in Mexico City at which the rubber planting areas of the world were given as follows:

| Location | Acres |
|---|---|
| Mexico | 95,000 |
| Malaya | 32,000 |
| Ceylon | 85,000 |
| Africa | 30,000 |
| Central America | 14,000 |
| Java | 10,000 |
| India | 8,200 |
| Brazil | 6,000 |
| Venezuela | 3,400 |
| Ecuador | 3,000 |
| N. Guinea | 2,800 |

It was reported at this meeting that some of the plantations in Mexico were earning from 15 to 25 per cent at prevailing rubber prices, while some cases of 40 to 50 per cent profit were reported from the Far East, especially in Ceylon.

Getting back to prices, by December 1, 1907, industrial conditions in the United States had brought the quotation on crude down to 75c, and a little later it went to 65c. There was a rally soon after, however, as the country began to emerge from the depression, and by November, 1908, the price had again crossed the dollar mark and stood at $1.25.

Here a writer in *The Horseless Age* darkly intimates that the market was being manipulated by the exporters in Brazil. Whether it was due to manipulation or not, the price held firm and instead of coming down began to creep higher. Production was increasing but so also was consumption. During the early part of 1909 the price hovered between $1.28 and $1.38 and it was said that the South American exporters were creating a fictitious value by refusing to sell for less, which is not surprising if we are to believe a writer of the period who stated in *La Finance Automobile* that "The Brazilian rubber producers did not earn any money when the price of Para fell below $1.30 per pound."

In the summer of 1909 the price of Para in New York went to $1.65. At this time it was estimated that there were 300,000 acres of rubber plantations in Ceylon and the Malay region and 100,000 elsewhere, principally in Mexico. On account of the high price everybody, as at present, was talking rubber and a great expansion in plantation development got under way. There seemed to be lots of money to be made in rubber and people everywhere clamored to make it. The natural result was speculation, with London as the center. The excitement increased as in the spring of 1910 the price rose to $2 a pound.

Many thought the limit surely had been reached when "two-dollar rubber" became an actuality, but still another spurt sent it to $2.60 a pound in April, 1910. And a week or so later it touched the top of $3.08.

Colonel Colt, then at the head of the United States Rubber Co., explained the unprecedented price as due largely to the law of supply and demand, although "wild speculation abroad has had considerable to do with it." Consumption, he said, was increasing faster than production. The *India Rubber World* also held the opinion that the situation was due to the economic law of supply and demand and flouted the idea that there was a cornering of the market in Brazil. It pointed out that "the price of $3 a pound is so alluring that every producer in the world is hurrying his rubber to market."

One of the most interesting comments on the situation came from F. A. Seiberling, then president of the Goodyear Tire and Rubber Co. Writing in *The Horseless Age*, he said: "For 50 years the price of crude rubber averaged considerably less than $1 per pound; two years ago it stood at 65c per pound, and today it is above $3—a level that takes it out of many a field it has heretofore occupied.

### Like a "South Sea Bubble"

"The high prices prevailing for crude rubber are fairly attributable to two primary causes: First, the abnormal draft upon the world's supply in providing tires for automobiles; second, the wild speculation in rubber and rubber shares in England, which has taken on the aspect of a "South Sea Bubble" in a mad scramble of people of all classes to "get rich quick" on rubber. London is the financial center of the world's rubber market and the craze now running its course there is having a tremendous influence toward lifting prices. This will correct itself in the collapse which, in due time, is certain to come.

"Stories are being circulated to the effect that the rubber supply is being rapidly exhausted, and that the world is facing a famine, but a careful review of the situation justifies an opposite opinion.

"The past year (1909) more than 70,000 tons of crude rubber, having a value approximately of $300,000,000, were produced, of which 40,000 came from the Amazon

district. And as yet we have only scratched the surface in this district. But a very important factor toward relieving the existing situation is found in the plantation rubber in the East Indies, which is now coming into the market in large quantities, each year's production being substantially double that of the preceding year. Whereas we had less than 4,000 tons in 1909, we shall receive approximately 8,000 tons in 1910, and well up to 16,000 tons in 1911, and within five years a quantity larger than is now furnished by the Amazon, which is a remarkable result considering the fact that three years ago the production of the entire East Indian district represented but a few hundred tons.

"Since it is known that plantation rubber can be produced for 25c a pound, as certain as night follows the day we will within a few years have a large oversupply that will bring the cost lower than it has ever been before."

Which was precisely what happened.

In that day, as in this, it was felt that conservation in the use of rubber products should be practiced to bring prices down. Mr. Seiberling closes with this sentence: "Users of rubber tires, on account of the present high prices, will have thought toward prolonging their life and increasing their mileage, which can readily be done by carrying proper pressure of air, and particularly with clincher tires, which, semi-deflated, will rim cut and speedily disintegrate."

---

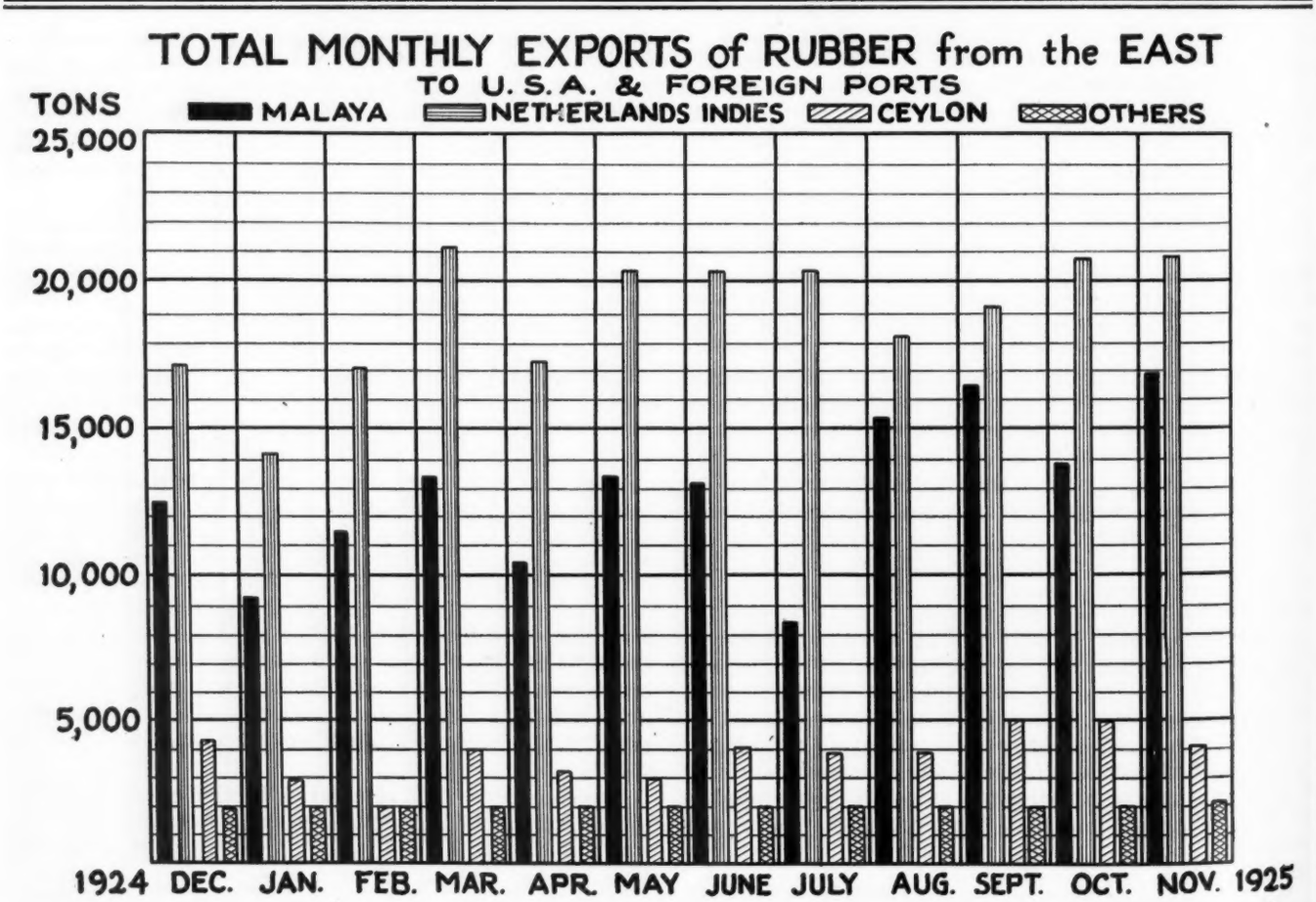
IT is estimated by a competent observer in the Union of South Africa that passenger automobiles in service there at the end of 1925 will number approximately 58,000. This is an increase of 7,500 over the number in use at the end of 1924. It is estimated that the imports of cars for 1925 will amount to approximately 12,000.

There were 3,322 motor and steam trucks in use at the end of 1924, and the estimated number for the end of 1925 is 4,600. The imports will total about 1,700 for 1925. Buses are included in these figures. A rough estimate of the number of buses in use is between 400 and 500. There were 19,819 motor cycles in use in the Union at the end of 1924, and the estimate for the end of 1925 is 23,000. Imports of motor cycles for the first five months of 1925 were heavy, totaling 500 a month. The total imports for the year will be about 4,500.

An official of the South African Motor Traders Association views the present position of the motor industry in South Africa as extremely satisfactory. At the end of October there were only 359 cars in bond at ports. He states that light cars are booming. This includes cars in the Ford, Chevrolet and Durant Junior class. There has been a slight drop in one or two cases as regards sales of heavier four-cylinder cars. Light sixes are holding their own, although there is a nervous feeling.

Considering only the white population, it is estimated that the following ratios obtain in the four provinces of the Union: Natal, one motor vehicle (cars and motor cycles) for every 12.5 persons; Transvaal, one motor vehicle for every 21 persons; Cape Colony, one for every 22 persons; Orange Free State, one for every 27 persons.

A considerable amount of highway work has been completed in the four Provinces of the Union during 1925, and a great deal more will be done under a new National road scheme during 1926.




*The above chart, compiled by the Crude Rubber & Foreign Produce Corp., shows from what areas the world at present derives its rubber and the proportion supplied by each area. It will be seen that the greatest supply comes from Netherlands Indies, with Malaya and Ceylon following in the order named. The supply from all other sources is very small.*

# EDITORIAL

## The Last Half of This Year—

### *Why Put the Skids Under It?*

FOR years we have been taught that the mental attitude of the public toward business has a great effect upon volume, and therefore it is difficult to understand why statisticians and leaders of finance and industry are now broadcasting the message that the first six months of 1926 are to be excellent, but are intimating that there may be a considerable curtailment of prosperity the last six months of the year.

Why should this pessimistic note prevail, and for what reason does the average man accept these statements as gospel and think in these terms without studying the subject carefully? Is it because men are like sheep, and when a stampede is started they all go in one direction?

When you deal in futures, you deal in uncertainties and there is no one who can predict accurately what is going to happen the first or the last six months of 1926; and since business is so materially affected by what people believe and say, would it not be wiser to predict a satisfactory condition for the entire year?

On what real, constructive theory is the statement based that the last half of the year will not be satisfactory? History has taught us that for many generations you can strike an average of seven good years for every three poor ones, and as we passed through the lean post-war period and are now on the up-grade, why should we look for trouble a few months ahead? Don't most people spend most when they have most? If this is so and the first six months of 1926 are money-makers, won't the last six months be made active by the money spenders?

It is always wise to be conservative and have one's house in order so that if things do not reach the standard of the optimist, it is possible to readjust expenses in order to make a profit even on a reduced volume. But is it wise to deliberately try to create an impression that business will be lean the last half of the year? No industry has ever demonstrated more thoroughly the value of optimism and energy than the automobile trade. If its manufacturers had years ago concluded that the saturation point had been reached and had ceased to expand factories and sales organizations, you would probably today find that our dear public would be satisfied with ten, instead of twenty million cars.

Optimism, energy and progressive methods have sold automobiles where it was seemingly impossible to sell them. It is true that the car industry has depended—to a certain extent—for its prosperity upon the success of all business, so why don't the men—the progressive men that we have in the great automobile industry—try to stem the tide of pessimistic talk about the last half of 1926? If all business is good the first half, should there not be enough momentum, enthusiasm and prosperity to carry us along serenely the second half?

These are questions to be considered and dealt with by everyone with large or small business interests, for we should not accept the predictions of the men who are following the lead of the few, especially when most of these predictions are based primarily on theory.

Let us make the *whole* of 1926 a big year, and not split it in half, keeping ever in mind that all destructive gossip is harmful.

C. J. Musselman

*President,* CHILTON CLASS JOURNAL CO.

AUTOMOTIVE NEWS SECTION INDUSTRIES

*Philadelphia, Pennsylvania*

*Thursday, January 28, 1926*

# Demand and Output at High Level for Season of Year

PHILADELPHIA, Jan.. 28—Production schedules in effect at motor car factories make it plain that the total output for the month will be one of the highest ever recorded for January. Manufacture is running ahead of sales, but not at an alarming distance so far, as retail demand is on an unusually high level for the season of the year.

With so much of the automobile industry's expectation of expanding distribution in 1926 resting on the outlook in the agricultural regions, the current weakness in wheat prices is being closely watched. While the decline has not gone far enough, in the opinion of market analysts, to affect to an appreciable extent the capacity of the farm regions to absorb cars, trucks and tractors, a reversal of the trend in prices would occasion general satisfaction.

**Tire Price Increase Unlikely**

The decline in crude rubber has relieved the tire situation, apparently making any further increases in tire prices a more or less remote contingency. There has been a widespread response to Secretary Hoover's recommendations for economy in the use of tires—to such an extent, apparently, as almost to amount to a buyer's strike. While this has had its reaction on the price of crude, it has by no means been a source of satisfaction to the tire dealers, whose inventories are customarily rather high at this time of year. The gain in tire repairing has scarcely compensated for the loss in orders for new tires.

While the position of the motor car manufacturers has been made somewhat easier by the improvement in the rubber situation, the tendency in prices of other materials and items entering into production costs has been upward rather than downward, and this factor lends color to predictions made by two or three leaders of the industry that list prices of cars are likely to be higher later in the season.

The optimism with which prospects for the year in foreign countries is viewed continues unabated, and an early announcement of another important transaction whereby an American company will acquire a controlling interest in a foreign producer of motor cars is looked for in the trade.

## Nash Stockholders Vote to Issue New Common

KENOSHA, WIS., Jan. 26—Stockholders of Nash Motors Co. in annual meeting today approved the plan to issue 9 shares of new common for each of the 273,000 present common.

Directors were re-elected.

## Fresh Developments Liven Rubber Drive

### Further Drop in Crude Brings Rumors of Tire Price Cut

NEW YORK, Jan. 28—Developments in the drive on rubber prices came thick and fast this week, with spot crude declining to around 67 cents, making the total drop in three weeks 42 cents. This further collapse in the market was accompanied by rumors that the tire companies were preparing to lower their lists. Although the usual denials were made by the companies directly implicated in the reports, they continued in circulation here and at Akron.

As tending to prevent immediate reductions in tire prices, officials of the companies declared that the situation was too uncertain to warrant changes at the present time, and that several of the large companies are fairly well stocked with crude bought at 80 cents to $1 a pound. But sales to dealers have dropped to such an extent that a revival of Spring dating is said to be under consideration by the Rubber Association of America, Inc. It is believed that if the dealers were protected against loss due to reductions they would place substantial orders.

**Fears Buyers' Strike**

George J. Burger, secretary-treasurer of the National Tire Dealers Association, declared that his association has always felt that the better-use-of-tire campaign could be misconstrued by the buying public and thus cause a buyers' strike.

"In view of the fact that for five years back it has seen nothing but low prices," said Mr. Burger, "this industry cannot afford to have a buyers' strike." He added that the decline in crude was probably only temporary.

Briefly summarized, developments incident to the Congressional rubber investigation this week were:

Speculation in rubber by American manufacturers was charged on the floor of the House by Representative Black of New York, who also declared that the House Interstate and Foreign Commerce Committee, which investigated the rubber monopoly, had evidence of rubber speculation in New York, "which cost rubber users millions last year."

Charges were also made from the floor of the House by Representative Shallenberger, minority member of the Commerce Committee, that the Committee's investigation showed that "the increase in the price of tires to the consumers was much greater than the increased cost to the manufacturer in the rise in crude rubber prices." He demanded that Congress investigate the rubber manufacturers' practices.

The Interstate Committee concluded its investigation, the last witness being H. N. Whitford, of the Rubber Association of America, Inc. Mr. Whitford told the Committee that establishment by the United States of a demonstration plantation in the Canal Zone would stimulate local Government interest and help to attract capital from this country. He declared that Panama offers the largest nearby potential supply of rubber plantation land.

A new appeal to tire-users was issued by Thomas P. Henry, president, American Automobile Association, asking them to voice their protest against the high cost of crude rubber. The appeal went to twenty-six European motoring organizations.

## G. M. Reported After French Organization

### Officials Said to be Negotiating With Mathis Societe Anonyme

PHILADELPHIA, Jan. 25—General Motors Corp. is reported in cabled advices from Paris to be negotiating for purchase of the Mathis automobile factory in Strasbourg and the sales organization of the factory throughout France. E. E. C. Mathis returned to Strasbourg from the United States a month ago, and is now understood to be sailing for New York Jan. 27 in company with a group of General Motors officials.

In New York this week, executives of General Motors Corp. declined to discuss the reports.

The Mathis Societe Anonyme is capitalized at 20,000,000 francs. Its product is of the small-car type, five models appearing in recent listings, three "fours" and two "sixes." Bore and stroke of the four-cylinder motors are 2⅜ x 3½, 2 11/16 x 3 15/16 and 2¾ x 4 in. Six-cylinder specifications are: 2 3/16 x 3⅛ and 2⅜ x 2¾ in. The wheelbases of these cars vary from 108 to 122 in., and the treads from 43 to 51 in. Thus, all of the cars are of the narrow-track type, and all carry engines of small displacement. Two of the engines have the cylinders in the head, while the other three have L-head engines.

# S.A.E. in Debate on Metal Airships

## Supercharger on Ordinary Cars, Amphibian Planes, Brake Squeals Are Topics

DETROIT, Jan. 27—A somewhat acrid debate about the relative merits and possibilities of the all-metal airship between Ralph H. Upson, Aircraft Development Corp., and Dr. Carl Arnstein, vice-president, Goodyear Zeppelin Co., was one of the outstanding features of the annual meeting of the Society of Automotive Engineers, which opened here yesterday.

**Super-Charger Evokes Interest**

A very general interest in super-charger development in connection with other than racing cars, presentation of new data concerning fuels for winter driving, and a statement by the retiring president, H. L. Horning, that "there will be no shortage of fuel as long as engineers and scientists live" were other developments of the sessions held on the two opening days.

Discussing papers on super-chargers, which were read by C. R. Short, General Motors Research Corp; Dr. S. A. Moss, General Electric Co., and C. W. Isler, General Motors Corp., Fred S. Duesenberg stated his belief that the real purpose of a super-charger is to break up the fuel better and increase efficiency of operation at low speeds, rather than to increase volumetric efficiency at high speeds and loads.

In his inaugural address, President T. J. Litle, Jr., urged that every engineer coming into the industry serve his apprenticeship in the mechanical shops rather than come into the engineering department directly. He emphasized the need of practical knowledge of production requirements.

**Loening on Amphibian Planes**

The ability of the amphibian plane to land and take off at places convenient to centers of population was one of the advantages urged for this type of plane by Grover C. Loening in his paper on "The Development of Amphibian Airplanes."

That all brake squeals of high pitch are caused by undamped or unmuffled drum vibrations and that the vibrations can be damped by making the lining conform with reasonable accuracy to the drum were among the conclusions reached by F. C. Stanley, Raybestos Co., in his paper on "Causes of and Remedies for Brake Squealing." This session, at which H. H. Allen, U. S. Bureau of Standards, talked on the effect of temperature on brake linings, developed considerable differences of opinion about the causes of brake squealing.

## Navy Rejects Ford Dirigible

WASHINGTON, Jan. 28—The Ford Motor Co.'s plans, submitted to the Navy Department several months ago, for a "flivver" type of dirigible, do not meet with the Department's requirements, Secretary Wilbur this week testified before the Naval Affairs Committee.

The Ford engineers submitted plans for an all-metal dirigible, which Ford agreed to build for $300,000 each. Secretary Wilbur voiced an opinion that instead of the "flivver" dirigible, the Navy should have the Shenandoah replaced.

## Buys Clydesdale Motor Truck Co.

NEW YORK, Jan. 26—The Clydesdale Motor Truck Co. plant at Clyde, Ohio, offered for sale on an order of the Federal District Court, was sold at auction by the Commerce Guardian Trust & Savings Bank, Toledo, Ohio, receivers, was bought by H. Peltrowitz of the Marine Metal Supply Co., New York.

"We are working on reorganization now," said Mr. Peltrowitz, "and expect to complete it soon. Meanwhile, we are operating the plant on a small scale for service and parts, and parts' orders are being filled. We hope to begin manufacturing trucks in two or three weeks."

## N. A. C. C. Issues New Automobile Handbook

NEW YORK, Jan. 28—What this country now has to offer for the world's motor transportation is shown in the twenty-third annual Handbook of Automobiles, just issued by the National Automobile Chamber of Commerce.

Illustrated specifications are given of 178 motor vehicles, and 770 models are listed. The specifications are grouped in four sections, including 100 private passenger cars, 5 taxicabs, 15 motor buses and 58 commercial cars and motor trucks, representative of this year's product of the manufacturers who are members of the Chamber. All of the vehicles shown are gasoline-driven, except 3 electric commercial vehicles.

## Pure Rubber Recovery Process Claimed Perfected

NEW YORK, Jan. 26—M. Royer, an engineer of Lyons, France, says he has perfected a process for the recovery of pure rubber from used rubber products, according to copyrighted cables to the New York Times. He is said to be conferring with representatives of British rubber interests and with an agent of the United States Department of Commerce for tests of the process, which, he claims, not only devulcanizes used rubber, but removes all impurities.

## Hayes Wheel Extra Dividend

JACKSON, MICH., Jan. 26—The Hayes Wheel Co. has declared an extra dividend of 25 cents a share on the common stock in addition to the regular quarterly 75 cents a share; also the regular quarterly of $1.87½ on the preferred, all payable Mar. 15 to stock of record Feb. 26.

# *Business in Brief*

*Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

**NEW YORK, Jan. 28**—Business in general is reasonably active, although the revival has so far failed to meet the most optimistic predictions. Unseasonably mild weather last week retarded trade in some lines, but stimulated building activity. The movement of general commodity prices was toward higher levels.

**CAR LOADINGS**

Car loadings continued in smaller volume than a year ago during the week ended Jan. 9, when the total was 907,119 cars, as compared with 741,239 in the preceding week, and 934,170 in the corresponding period last year.

**FOREIGN TRADE**

Exports in December, according to the preliminary estimate, reached a total of $468,000,000, as compared with $446,000,000 a year earlier. Imports of $394,000,000 compare with $333,000,000 in December, 1924. The trade balance was only $74,000,000, as against $113,000,000 a year ago. For the entire year, the value of exports was $4,909,000,000, and that of imports $4,224,000,000, leaving an export balance of $685,000,000, against $981,000,000 in 1924.

**BUSINESS FAILURES**

Business failures reported to Bradstreet's for the week ended Jan. 21 numbered 507, which compared with 523 in the preceding week, and 528 in the corresponding period last year.

**BANK DEBITS**

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended Jan. 20 were 3.9 per cent above the total for the preceding week, and 13 per cent above that of a year ago.

**BUSINESS INDICES**

Fisher's index of wholesale commodity prices stood at 159.2 last week, as against 158.7 in the preceding week, and 157.9 four weeks earlier. The Department of Labor's Index for last month is 156.2, which compares with 157.7 for November, and 157.0 for December, 1924.

**FEDERAL RESERVE STATEMENT**

Bills and securities held by the Federal Reserve Banks declined $73,500,000 during the week ended Jan. 20, with declines of $52,600,000 in discounts, and $21,600,000 in open market purchases, and a gain of $1,200,000 in Government securities. Note circulation decreased $41,300,000, and deposits $26,700,000, while reserves increased $17,000,000. The reserve ratio rose from 72.7 to 74.4 per cent.

**MONEY**

On Monday of this week the rate on time loans reached 4½ per cent. Call loan and commercial paper rates were unchanged at 4 to 4½ per cent and 4¼ to 4½ per cent, respectively.

# Steel Orders Slack, Price Trend Lower

## Sales Managers and Consumers Go to the Mat on Prices—Concessions Urged

NEW YORK, Jan. 28—Steel mill sales managers voice disappointment that automotive orders are not coming in with a greater rush. They had expected that, during the week following the New York show passenger motor car manufacturers would be in the market for heavy tonnages of bars and sheets, etc. There are still considerable amounts of steel due to automotive consumers on old contracts, but in some lines these have been fully specified against.

Full-finished automobile sheets, not so many weeks ago the firmest item on the list and the top-notch seller, are in so light demand that some mills are reported to be shading prices when attractive specifications are offered. The higher prices for sheet-bars which were asked a fortnight ago have petered out, and the market is again easy at $36.

As for their expectancy of heavy automotive demand over the year's first and second quarters, sales managers of steel mills have not in the least modified their views. It is merely a case of hope deferred for the present. Automotive consumers, on the other hand, consider this the opportune moment for going to the mat with their suppliers on prices. They are urging concessions as the best means of landing their orders.

### The Metal Markets

**Pig Iron**—Automotive foundries display very little interest in the market, which, on the whole, continues dull. They buy mostly in single carloads when they buy at all.

**Aluminum**—The trade is discussing the possibility of the domestic producer who was instrumental in securing the high rate of duties on aluminum embodied in the 1922 Customs Act having to plead for a reduction in these duties, once its large Canadian plant, now being erected, is in operation, so as to facilitate the flow of its Canadian output into the United States. What with its interests in Norway and importations from Germany, it has long been obvious to the aluminum consumer that the leading interest is developing from a national into an international producer. Once this transition is completed, the tariff protection which made the infant industry's growth possible would become a hindrance. Market conditions are unchanged.

**Copper**—Emulating Mr. Schwab's example with regard to the steel price, President C. M. Loeb, of the American Metal Co., is out with a statement that copper is too cheap. The market, however, continues tame.

**Tin**—See-saw conditions still prevail. Cheap silver has not made a dent in the price of Chinese tin, usually affected by such a condition.

**Lead**—Slightly easier tone. Price unchanged.

**Zinc**—Easier and fractionally lower.

## *DETROIT EMPLOYMENT SHOWS BIG INCREASE*

**DETROIT, Jan. 25—Upward of 260,759 factory workers were employed in the Detroit area in the week ended Jan. 19, according to figures just released by the Employer's Association of Detroit. Automotive firms in this area employ approximately 211,814 of this number.**

**According to statistics, the number of factory workers employed was 53,785 less in the corresponding period a year ago.**

# Kissel Predicts Higher Car Prices

MILWAUKEE, Jan. 25—Another automobile manufacturer has added the weight of his opinion to that of those leaders in the industry who are looking for higher prices in the industry. G. A. Kissel, president of the Kissel Motor Car Co., of Hartford, Wis., present at the Milwaukee Automobile Show Jan. 16-23, said:

"Higher prices for motor cars are in the offing unless present signs are wrong. Increased material costs have had a very pronounced influence in retarding further price declines, and only a cheapening of the product can now justify a price reduction in the majority of cases. While I would not care to predict with certainty any definite upward movement in price levels, I at least feel safe in pointing out that further declines are virtually impossible, except under the conditions specified."

Study of the public's reaction at the New York show and again locally has convinced Mr. Kissel that the next ten months will be exceptionally favorable ones for the industry and that a high degree of enthusiasm over 1926 prospects is fully justified.

## Heald Celebrates Centenary

WORCESTER, MASS., Jan. 25—At the recent centenary celebration of the Heald Machine Co., James N. Heald, treasurer and general manager, presented gold watches to the twelve 15-year service men, and a purse of gold to the six 20-year service men. The employees presented Mr. Heald with a bronze tablet commemorating the anniversary.

The company has also issued a brochure entitled "The First Ledger" to commemorate the anniversary.

# Chrysler-Palmetto Case to High Court

## To Determine Whether or Not Car Salesmen Must Have Insurance Licenses

NEW YORK, Jan. 23—Litigation over the Chrysler-Palmetto insurance plan has been advanced to the calendar of the United States Supreme Court by appeals from Federal Court decisions in Maine and Wisconsin. It is understood that the Supreme Court's decision will depend upon what constitutes an insurance agent, and whether or not the application of state insurance laws against the blanket policy obtained in Michigan is in violation of the fourteenth amendment to the Constitution.

The Chrysler plan was upheld in a decision yesterday by Judge Conrad Olson in St. Paul, Minn., in a test case brought by the Minnesota insurance department against a salesman employed by the McGill Motor Co. of St. Paul, Chrysler distributor, for alleged violation of the state insurance laws. Judge Olson held that the facts as presented showed no such violation, and, therefore, dismissed the case.

The Minnesota attorney general had argued that a salesman selling an insured car was an insurance agent and must have a license.

## 1924 Highway Building Cost $1.11 Per Capita

WASHINGTON, Jan. 27—The costs of maintaining the highways of the Nation during 1924 was $1.11 per capita, according to financial statistics of the 48 state governments in 1924, just completed by the U. S. Bureau of the Census.

The total operating and maintenance for all the states amounted to $1,001,465,000, or $9 per capita. Of this sum, $123,308,000 was expended in maintaining the highways. Expressed another way, the figures show that for all the states, 12.3 per cent of the total expenditures was for highway operation and maintenance. This does not include new highway construction projects.

Incidentally, the assessed valuation of property in all the states, subject to general property taxes, amounted in 1924 to $131,333,557,565, or a per capita of $1,180.16.

## Louis H. Sebbes Dead

CHICAGO, Jan. 25—Louis H. Sebbes, formerly with the Chilton Class Journal Co. as editor of Chilton Automobile Directory and the Automobile Trade Directory, died at his home here last week after an illness of two months. Since leaving the Chilton Class Journal Co. a few months ago he had been an account executive with the Reinicke-Ellis Advertising Agency of Chicago.

## Exports, Imports and Reimports of the Automotive Industry for December, 1925, and Total for Twelve Months Ended December, 1925

| | Month of December | | | | Twelve Months Ended | | | |
|---|---|---|---|---|---|---|---|---|
| | 1924 | | 1925 | | 1924 | | 1925 | |
| | Number | Value | Number | Value | Number | Value | Number | Value |
| **EXPORTS** | | | | | | | | |
| Automobiles, including chassis (total) | 13,021 | $11,281,486 | 33,534 | $22,853,106 | 178,883 | $131,922,701 | 303,043 | $222,794,738 |
| Electric trucks and passenger cars | 5 | 6,345 | 14 | 19,903 | 151 | 188,628 | 119 | 195,606 |
| Motor trucks and buses, except electric: | | | | | | | | |
| Up to 1 ton | 1,253 | 571,277 | ... | ... | 20,652 | 8,408,313 | ... | ... |
| Over 1 and up to 2½ tons | 413 | 555,833 | 1,252 | 1,689,184 | 5,209 | 7,082,018 | 10,423 | 13,013,936 |
| Over 2½ tons | 80 | 207,863 | 228 | 753,399 | 1,491 | 3,709,013 | 1,699 | 5,249,016 |
| Total motor trucks and buses, except electric | 1,746 | 1,334,973 | 8,901 | 5,390,757 | 27,352 | 19,199,344 | 58,624 | 37,703,302 |
| **PASSENGER CARS** | | | | | | | | |
| Passenger cars, except electric: | | | | | | | | |
| Value up to $500, inclusive | 3,282 | 1,137,310 | 11,872 | 4,486,168 | 59,175 | 21,485,955 | 100,230 | 37,169,599 |
| Value over $500 and up to $800 | 2,871 | 2,085,887 | 4,890 | 3,344,951 | 42,406 | 29,012,219 | 60,448 | 42,928,936 |
| Value over $800 and up to $2,000 | 4,809 | 5,831,713 | ... | ... | 46,256 | 52,083,494 | ... | ... |
| Value over $800 and up to $1,200 | ... | ... | 6,103 | 6,423,159 | ... | ... | 59,842 | 62,830,910 |
| Value over $1,200 and up to $2,000 | ... | ... | 1,270 | 1,886,732 | ... | ... | 18,565 | 27,746,946 |
| Value over $2,000 | 308 | 885,258 | 484 | 1,301,436 | 3,543 | 9,953,061 | 5,215 | 14,219,439 |
| Total passenger cars, except electric | 11,270 | 9,940,168 | 24,619 | 17,442,446 | 151,380 | 112,534,729 | 244,300 | 184,895,830 |
| **PARTS, ETC.** | | | | | | | | |
| Parts, except engines and tires (Lbs.): | | | | | | | | |
| Automobile unit assemblies (Lbs.) | 15,634,675 | 2,871,142 | 23,863,892 | 3,854,387 | 251,574,762 | 44,974,957 | 241,995,953 | 42,486,859 |
| Automobile parts for replacement (Lbs.) | 5,265,745 | 1,429,010 | 13,476,776 | 3,279,888 | 86,866,829 | 21,965,198 | 108,808,122 | 29,213,307 |
| Accessories (Lbs.) | 1,138,556 | 500,357 | 1,616,632 | 753,189 | 17,982,988 | 6,821,079 | 19,467,048 | 8,611,000 |
| Automobile service appliances (n.e.s.) (Lbs.) | 536,070 | 243,689 | 958,142 | 407,002 | 7,027,860 | 2,841,453 | 13,368,572 | 5,432,220 |
| Station and warehouse motor trucks (No.) | 28 | 10,572 | 14 | 16,518 | 159 | 91,810 | 248 | 193,970 |
| Trailers (No.) | 22 | 4,733 | 93 | 23,362 | 553 | 201,162 | 623 | 281,513 |
| Airplanes (No.) | 4 | 53,781 | 3 | 53,329 | 59 | 412,738 | 80 | 511,282 |
| Parts of airplanes, except engines and tires (Lbs.) | 160 | 905 | 1,012 | 1,835 | 165,472 | 165,926 | 95,248 | 101,584 |
| **BICYCLES, ETC.** | | | | | | | | |
| Bicycles and tricycles (No.) | 572 | 15,193 | 809 | 31,638 | 6,967 | 174,733 | 7,730 | 214,603 |
| Motorcycles (No.) | 1,540 | 345,263 | 2,365 | 504,330 | 16,859 | 4,006,408 | 22,825 | 5,075,139 |
| Parts, except tires (Lbs.) | 187,231 | 100,407 | 315,674 | 167,848 | 2,894,221 | 1,596,780 | 2,937,662 | 1,668,445 |
| **INTERNAL COMBUSTION ENGINES** | | | | | | | | |
| Stationary and portable: | | | | | | | | |
| Diesel and Semi-Diesel (No.) | 15 | 74,344 | 115 | 76,251 | 1,600 | 610,390 | 1,289 | 858,574 |
| Other stationary and portable: | | | | | | | | |
| Not over 10 H.P. | 2,086 | 182,950 | 2,300 | 196,392 | 26,397 | 2,517,397 | 28,491 | 2,440,966 |
| Over 10 H.P. | 99 | 81,733 | 103 | 139,595 | 2,228 | 1,586,989 | 2,486 | 2,326,013 |
| Automobile engines for: | | | | | | | | |
| Motor trucks and buses | 2,936 | 233,735 | 2,564 | 215,279 | 4,068 | 415,066 | 41,571 | 3,550,061 |
| Passenger cars | 6,281 | 690,379 | 8,216 | 762,801 | 26,700 | 3,773,360 | 104,577 | 11,723,891 |
| Tractors | 50 | 22,546 | 54 | 34,469 | 2,467 | 774,544 | 1,450 | 613,420 |
| Aircraft | 1 | 1,500 | 14 | 23,351 | 146 | 219,609 | 73 | 170,793 |
| Accessories and parts (Lbs.) | 445,505 | 193,126 | 703,718 | 352,941 | 8,040,973 | 3,471,783 | 8,931,411 | 4,110,699 |
| **IMPORTS** | | | | | | | | |
| Automobile and chassis (dutiable) | 53 | 78,961 | 38 | 79,212 | 604 | 841,524 | 678 | 1,079,560 |
| Other vehicles and parts for them (dutiable) | ... | 31,025 | ... | 96.059 | ... | 984,919 | ... | 859,893 |
| **REIMPORTS** | | | | | | | | |
| Automobiles (free from duty) | 20 | 21,495 | 13 | 31,522 | 516 | 753,590 | 207 | 303,879 |

# December Exports Reach 41,520 Mark

NEW YORK, Jan. 28—Figures just announced by the National Automobile Chamber of Commerce show that continuing the progress in sales of American automobiles abroad, the motor vehicle manufacturers of this country established new export records in December, both for motor cars and trucks.

There were 31,110 cars and 10,410 trucks exported from U. S. and Canadian ports. These figures do not include the motor vehicles of American make assembled abroad.

The gain is considered by the automobile industry to be particularly significant since December is usually lighter in exports than the spring months.

## Niagara Body Has New Plant

BUFFALO, N. Y., Jan. 26—Lewis J. Pfohl, of the Niagara Body Co., announces the beginning of construction of its new plant here, and states that it will be ready for occupancy March 1. It will contain 44,000 sq. ft. of floor space, all on one floor, costing $100,000, modern daylight construction.

## Erie Iron Has Wheel Division

ERIE, PA., Jan. 25—In announcing the formation of the Van metal wheel division of the Erie Malleable Iron Co., greatly increased production facilities have been made possible, according to company officials. This division is to be an integral part of the company, and will manufacture wheels under patents of the Van Wheel Corp. Management and sales of the wheel division will be under the supervision of the Van Wheel Corp.'s officers.

Production will be under way at the Erie division in February. The Van Wheel plant at Oneida, N. Y., will continue as in the past.

## 102,909 Persons Visited Willys-Overland Exhibit

NEW YORK, Jan. 25—An indication of the success of the New York show is seen in a report from the Willys-Overland factory that 102,909 people visited its exhibit, and that 594 Overland and Willys-Knight cars were sold in New York during show week. The factory reports 20,071 visitors at the exhibit on the opening day, with a sale of 40 cars, compared with 28 on the first two days of show week in 1925.

## Recourse in Studebaker Plan

NEW YORK, Jan. 27—The financing arrangement recently entered into by the Industrial Acceptance Corp. and the Studebaker Corp. of America is in full operation. The new financing plan includes fire and theft insurance and recourse in every instance, and conforms to the regulations adopted by the National Association of Finance Companies.

# Delivery Truck Men to Hold Exhibition

CHICAGO, Jan. 27—Many of the leading light delivery truck manufacturers of the country will exhibit at the Delivery Truck & Accessory Exposition, which will open in the new Exposition Hall of the Hotel Sherman Monday morning and continue until Feb. 6.

The show is promoted by the exposition department of the hotel company. Twelve thousand sq. ft. of space in the new hall and mezzanine will be devoted to the truck and accessory display. Attendance is free and is by invitation.

The Pac Age Kar Corp. will present a truck with which the concern has been experimenting for the last 14 years. It is intended for frequent stop delivery. It is said to have a maximum speed of 15 m. p. h. and a high gasoline mileage. Either the entire power unit or the cylinders can be replaced quickly. It is water-cooled and is said to be able to freeze solid without endangering the parts. The truck has a 15-ft. turning radius and dual control, and the throttle, clutch and brake are all controlled by one lever.

## Sandow Truck Opens Branch

CHICAGO HEIGHTS, ILL., Jan. 26—The Sandow Motor Truck Co. announces the opening of a factory branch at 434-440 East 108th St., New York City.

# Automotive Excise Taxes Show Gain

WASHINGTON, Jan. 28—A total of $79,105,818.92 was collected from the automobile industry in excise taxes for the last six months of last year, compared with $60,361,855.67, collected in the corresponding period of 1914, representing a gain of $18,743,963.25 in 1925.

The Internal Revenue figures show the December, 1925, excise taxes from automobiles, motorcycles and accessories were $12,490,663.56, compared with $10,762,178.93 in December, 1924.

Of the total, $1,186,288.34 was collected from the sale of trucks, compared with $361,481 collected in December, 1924; automobiles and motorcycles taxes amounted to $9,384,606.01, in December, 1925, compared with $8,585,993.39 in December, 1924, and parts and accessories, $1,919,769.21 in December, 1925, compared with $1,814,703.93 in December, 1924.

## Senate Members Insistent on 2 Per Cent Truck Tax

WASHINGTON, Jan. 27—An active campaign to defeat the Senate's imposition of the two per cent tax on trucks was decided upon here today by representatives of seven national automotive manufacturers, dealers and users associations. Representatives of the automobile industry were told that it was the Senate's intention to impose the tax.

As a result of the conference, hundreds of telegrams were immediately sent to larger users of trucks, dealers, etc., asking them immediately to wire their Senators, informing them of their position on the two per cent truck tax.

## New Method of Alloying Aluminum Discovered

WASHINGTON, Jan. 28—Word of the discovery of a method for alloying aluminum with other metals, producing materials for automobile bodies which will not show scratches, and will have both color and finish "built in" has been received by the automotive division of the Commerce Department from Berlin. The discovery is claimed by B. Jirotka, a German electrical engineer. The advices state Jirotka has demonstrated his discovery to a commission of metallurgists of the German Institute of Chemical Technology.

## Ships Unboxed Cars Abroad

DETROIT, Jan. 26—R. S. MacElwee, port commissioner of Charleston, S. C., who was the principal speaker at the recent meeting of the factory traffic managers of the National Automobile Chamber of Commerce, told how automobiles were shipped from his home port to European points without being boxed.

### 217,112 FORD TRUCKS IN 1925

DETROIT, Jan. 28—Total production of Ford one-ton trucks in 1925 was 217,112, or 16,826 more than in 1925.

# Chicago Dealers Rap New Financing Plans

CHICAGO, Jan. 25—Resolutions declaring that automobile merchants have been placed in a critical position by current developments in the financing situation were passed at a recent meeting of the Chicago Automobile Trade Association. Strong opposition to dealer endorsement of time, paper or signing of repurchase agreements is expressed.

"Advertising low down-payments, low finance charges and extended deferred payments, based on subsidized finance charges, does not promote the welfare of either the manufacturer or the dealer, and will not increase new car sales when universally adopted; but, on the other hand, will increase time sales and lessen cash sales—which is not good business," the resolutions declare, continuing:

"These financing plans have placed the industry in a very critical position, due to the flood of dealer-endorsed time-payment paper which has gone into the banks, seriously crippling the bank credit of the smaller dealers.

"We are strongly opposed to any plan for financing the sale of new automobiles which provides for a down-payment of less than one-third of the selling price, or for deferred payments extending over more than twelve months as economically and financially unsound, creating an increased hazard for the industry and threatening the complete demoralization of the new and used car business."

# Developments of the Week in Leading Motor Stocks

NEW YORK, Jan. 28—Save for the restless activities of a few speculative pools in stocks classed as specialties, prices on the New York Stock Exchange this week have been without definite trend. In the early part of the week trading was held in abeyance, due to the impending dividend action to be taken by the directors of the U. S. Steel Corp. and the making public of the operating figures for the last quarter of 1925.

Directors of the U. S. Steel Corp. did what had been expected in well-informed quarters in the Street, by declaring the regular quarterly dividend of $1.25 on the common stock, and the usual extra of 50 cents per share. The regular quarterly disbursement of $1.75 was authorized on the preferred stock. Earnings of $42,480,465 for the quarter compared with $42,400,412 in the previous quarter, and $30,762,231 in the final quarter of 1924.

The prosperity of the steel industry is so closely related to that of the motor industry that the figures were scrutinized for a possible clue as to the results to be shown by some of the motor car companies for the corresponding period. Both industries experienced an abnormal degree of activity during the quarter and both were subject to the same slackening of operations during the final month of the quarter, it is pointed out.

As Judge Gary is enthusiastically optimistic in his predictions for the steel business during the first half of the year at least, so the leaders in the automotive industries are similarly optimistic, but this mental viewpoint is at wide variance with the temporary mood of the financial district.

### Replacement Demand to Gain

Stewart MacDonald, president of the Moon Motor Car Co., expressed the opinion that a substantially larger replacement demand for cars will be seen this year as well as an increase in export business. He estimated earnings at between $6.50 and $7 per share on his company's stock for 1925, and predicted that the company would produce and sell about 40 per cent more cars this year than in 1925.

A flurry in Jordan shares was generally attributed to the hurried covering of short contracts, although the advance was accompanied by reports of its being taken under the wing of the Hudson Motor Car Co. or Dodge Bros., Inc. As a matter of fact, usually well-informed quarters estimate that net earnings for 1925 will approximate $8 per share, the final quarter having practically equaled the results of the first nine months, according to these sources. Elsewhere in the motor list, prices backed and filled idly.

Outstanding strength for a day in the shares of the U. S. Rubber Co. accompanied a further decline in the price of crude rubber. In the days when the crude rubber market was soaring, the inventory position of U. S. Rubber was given as a reason for the advance in that stock.. Now it is held that the company will benefit by a decline in the price of crude in preparation for its commitments for the coming year. The stock is a speculative favorite, and the hurried retreat of the short interest probably was responsible for the buying.

Some intimations are beginning to drift into the financial district of increases in prices to be announced by various companies, due in part to the higher cost of raw materials, and in part to the large demand which is developing. There have been conflicting reports in circulation as to the policy of the tire companies. One version has it that prices are to be advanced because of the high price of crude rubber, and another that reductions will be announced within ten days due to the recent decline in the price of crude.—H. H. S.

# M.& A.M.A Finds Trade at Good Level

## Replacement Parts Shipments Rise in December, as Original Equipment Falls

NEW YORK, Jan. 24—Shipments of replacement parts and service equipment rose in December as against November, but shipments of original equipment and accessories were slightly lower, according to the January Business Bulletin of the Motor & Accessory Manufacturers Association. The composite index number for all four divisions was 137 for December, against 140 in November, and 188 in October. The base is 100 for January, 1925.

The index number for replacement parts stood at 145, compared with 133 in November, while the gain in service equipment was also marked, the December index standing at 110 against 96 in November.

### Index Number Falls

The slight decline registered in original equipment shipments, which brought the index number to 141 against 149 in November, left this section of the business still at an unusually high level for the season, and business being booked in January is an indication of the high rate of motor car production to be expected throughout the first quarter of the year.

The index number for accessories stood at 146 in December, against 158 in November, marking the normal seasonal decline, but still keeping the level far above that of a year ago.

Business of parts, accessory and service equipment jobbers during 1925 ran fully 10 per cent ahead of 1924 in dollars and cents volume, according to reports to the M. & A. M. A., but the tonnage sales were even higher, as price reductions in many lines held down the money increase. Jobbers' December business was better than November, except in western Pennsylvania, affected by the coal strike. The gain was due in part to Christmas merchandising.

## Flint Shareholders Vote $2,500,000 Bond Issue

FLINT, MICH., Jan. 25—By a large majority, the shareholders of the Flint Motor Co. voted at a special meeting to approve a resolution to float a bond issue of $2,500,000 to be used to repay the indebtedness of the corporation to Durant Motors, Inc.

The bonds will be protected by a mortgage covering the factory and equipment of the Flint Motor Co.

## American Bosch Magneto 1925 Earnings $500,000

SPRINGFIELD, MASS., Jan. 28—The American Bosch Magneto Corp. last year, after all charges, earned about $500,000, against $107,000 in 1924, or $2.41 a share against 77 cents in the preceding year.

During the year the company increased its stock 50 per cent in order to retire its 8 per cent notes. This represented an interest charge of $180,000, or almost 90 cents a share on present capital. As a result of radio business, net for the last three months was $225,000, or $60,000 more than in the second quarter. In the last 21 months, $3,800,000 of floated and funded debts has been eliminated.

## Boeing Offers Notes

SEATTLE, WASH., Jan. 26—Dean, Witter & Co. announce the offering of $1,500,000 W. E. Boeing 6 per cent secured gold notes, dated Nov. 1, 1925, due Nov. 1, 1927-39, inclusive. The capital thus obtained is to be used to increase production of iron ore properties in the Mesabi Range, Minn. The Dexter Horton National Bank of Seattle, is the trustee.

## W. R. Brashear is Named Moon Motors Vice-President

ST. LOUIS, Jan. 26—W. R. Brashear, formerly assistant general sales manager of the Moon Motor Car Co., has been appointed vice-president of Moon Motors Corp., a subsidiary of the Moon Motor Car Co., and will have charge of all Moon and Diana branches throughout the country.

## F. L. McFarlane Buried

DETROIT, Jan. 25—The funeral of F. L. McFarlane, secretary-treasurer of the Rex Products Mfg. Co., was held here last week. Mr. McFarlane died suddenly of heart trouble.

## *Complete Calendar of Events in Connection with the Chicago National Automobile Show*

**SATURDAY, JAN. 30**

Eleventh Annual Automobile Salon opens at Drake Hotel in conjunction with National Automobile Show in Coliseum.

**SUNDAY, JAN. 31**

Dinner, Chicago Boosters' Club (time and place not set).

**MONDAY, FEB. 1**

Ninth Annual Convention National Automobile Dealers Association opens at LaSalle Hotel and continues to Feb. 3.

Dinner and meeting, Remy Electric Co., 6.30 P. M. Congress Hotel.

**TUESDAY, FEB. 2**

Convention of Automotive Electric Service Association opens at Congress Hotel and continues through Feb. 3.

Luncheon, Chicago Flint Co., 1 P. M., in Gold Room of Congress Hotel.

Meeting of zone and regional managers of Chevrolet Motor Co. continues through Feb. 3.

Luncheon, Oakland Motor Car Co., 12 to 4 P. M., in Grand Ball Room of Blackstone Hotel.

Hudson Motor Car Co. opens daily meetings from 9 to 5, Feb. 2, 3, 4 and 5, at Blackstone Hotel.

Banquet of National Automobile Dealers' Association, LaSalle Hotel, 6 P. M.

**WEDNESDAY, FEB. 3**

Luncheon, Chicago Nash Co., in Gold Room of Congress Hotel at 12.30 P. M.

Business Meeting for Oldsmobile salesmanagers and bankers at Eighth Street Theatre at 2.30 P. M.

President's luncheon, Franklin Automobile Co., at Drake Hotel at 6.30 P. M.

Dinner, Oldsmobile Western Dealers, Grand Ball Room of Hotel LaSalle.

Banquet, Federal Motor Truck Co., Florentine Room of Congress Hotel at 6 P. M.

Dinner, Paige-Detroit Motor Car Co., 6 P. M., at Blackstone Hotel.

Banquet of 500 Club (formerly "Old Timers' Club"), Florentine Room, Congress Hotel, at 6.30 P. M.

Luncheon, Auburn Automobile Co., 12.30 P. M., in Ball Room of Blackstone Hotel.

Luncheon, 12.30 P. M., by Rickenbacker Motor Co., at Blackstone Hotel.

Dealer meeting of Auburn Automobile Co., 10 A. M., Blackstone Hotel.

Sales convention by Bird-Sykes Co., Paige-Jewett dealer, 2 P. M., Pershing Room, Lexington Hotel.

**THURSDAY, FEB. 4**

Luncheon and meeting, Chrysler Corp., 12.30 P. M., in Gold Room of Congress Hotel.

Luncheon, Velie Motors Corp., Florentine Room of Congress at 12.30 P. M.

Luncheon, Buick Motor Co., Large French Room of Blackstone Hotel at 12.30 P. M.

Dinner, Studebaker Corp., Ball Room of Blackstone Hotel at 6.30 P. M.

Annual meeting and luncheon, National Association of Automobile Show & Association Managers, Room "B," Drake Hotel, at 1 P. M.

Dinner and meeting of Automotive Manufacturers Association at City Club, 6.30 P. M.

**FRIDAY, FEB. 5**

Meeting of Chevrolet dealers beginning at noon in Apollo Theatre.

Convention of National Battery Manufacturers Association opens in Sherman Hotel to continue through Feb. 6.

# Car & Foundry Co. Enters New Fields

## Mergers Take It Into Engine, Bus, Carburetor and Wheel Manufacture

NEW YORK, Jan. 28—On completion of various mergers and reorganizations, the American Car & Foundry Co. itself or through its subsidiaries will be a manufacturer not only of steam and electric railway equipment, but also of motor buses, engines, wheels, carburetors and motor vehicle unit parts. Rumors that the company is negotiating for control of a large truck producer could not be confirmed.

American Car & Foundry will control the J. G. Brill Corp., organized to acquire the J. G. Brill Co., Philadelphia. The American Car & Foundry Motors Co., which controls the Hall-Scott Motors Co. of California and the Fageol Motors Co. of Ohio, will be controlled by the J. G. Brill Corp.

American Car & Foundry, in addition to the ownership of the Carter Carburetor Co., has made a cooperative agreement with the Dayton Wire Wheel Co. for manufacture of the Dayton steel spoke wheel. American Car & Foundry is also making motor boats.

Common stockholders of American Car & Foundry will be offered the right to subscribe to new J. G. Brill Corp. stock on the basis of two shares of Class A and one of Class B for each eight shares of Car & Foundry common held at $122 per unit.

## 1925 India Tire Sales 69.6 Per Cent Over 1924

AKRON, OHIO, Jan. 27—Net sales of the India Tire & Rubber Co. for 1925 were $4,600,121.40, representing an increase of 69.6 per cent over 1924 business, according to President J. M. Alderfer.

Net earnings totaled $471,476.38, the average profit on sales being figured at 10.2 per cent.

## Monarch Tractor Co. Moves to Springfield

SPRINGFIELD, ILL., Jan. 25—The Monarch Tractor Co., Inc., of Watertown, Wis., manufacturer of 5- and 10-ton caterpillar tractors, designed for road-grading, lumbering and heavy duty, will move its plant to this city about Mar. 1, as the result of commercial activities of a group of Springfield industrialists and business men headed by R. C. Lamphier, president of the Sangamo Electric Co. The Monarch will occupy the old Fetzer plant on Standard Ave. and will employ 120 men. Its first year's output is estimated at 350 machines, of a gross value of $1,000,000.

The plan is to reincorporate the company under the Illinois law, with $6,000,000 capital, issuing 6,000 shares of common stock at $100. Two thousand shares have already been subsribed in this city.

Robert Gottshall is managing head of the concern. He was formerly assistant general manager in charge of production of the Holt tractor plant at Peoria. M. B. Baker, former general sales manager for the Holt plant, will be vice-president in charge of sales. E. B. Caldwill, New York, will be chairman of the board of directors and three or four local men will serve on that body.

# Gabriel Snubber Net Earnings Show Gain

CLEVELAND, Jan. 28—The Gabriel Snubber Mfg. Co. reports, for the year ended Dec. 31, 1925, net earnings, after charges and taxes, of $1,314,081, compared with $1,086,195 for 1924.

Earnings per share on the 200,000 no par value Class A and Class B shares for 1925 were $6.57, against $5.43 for 1924. Current assets are reported as $1,582,207, and current liabilities, $309,089.

## Millspaugh & Irish Corp. Leases Additional Space

INDIANAPOLIS, Jan. 26—The Millspaugh & Irish Corp. of this city has been forced by increased business to take over additional quarters and has leased two floors of the former Cole plant here as general headquarters and finishing department. It retains its large English Ave. plant, which, with the additional section of the Cole plant, will give it adequate quarters to make the necessary expansion in production plans now under way.

The concern supplies taxicab bodies to several of the largest taxicab-producing companies. Officers of the company are: Harry B. Millspaugh, president; Clarence R. Irish, vice-president and general manager, and Allen Backet, secretary-treasurer.

Since the death of J. J. Cole, president of the Cole Motor Car Co., his widow has leased sections of the Cole plant to manufacturing and commercial enterprises. The Duco Corp. of Indiana also has two floors in the plant.

## Fremont Body Lets Contract

FREMONT, OHIO, Jan. 27—At a meeting of the board of directors recently of the Fremont Metal Body Co., manufacturer of auto truck and bus bodies, contract was awarded for the erection of a new factory building to replace the one destroyed by fire not very long ago.

## Wagner Corp. Moves Office

OMAHA, NEB., Jan. 26—The Wagner Electric Corp. announces the removal of its Omaha office, Jan. 25, to 2566 Leavenworth St.

# FINANCIAL NOTES

**Fisk Rubber Co.**—This company announces that the plan recently approved by the board of directors for the liquidation of all dividends on the outstanding preferred stock has been declared operative.

In conformity with the plan, the company, it is said, offers to pay $1 cash and $25 par value of first preferred convertible stock for each registered share of said stock upon surrender of the certificate to either the Bankers Trust Co. of New York or the New England Trust Co. of Boston.

The company has also announced the regular quarterly dividend of $1.75 a share on the first preferred stock, payable Feb. 1 to holders of record of Jan. 20. The directors also declared a quarterly dividend of $1.75 on the first preferred, and an initial quarterly dividend of the same amount on the first preferred convertible stock, both payable May 1 to holders of record of April 15.

**Chandler Motor Car Co.**—Stockholders of this company have been officially notified that the plan for consolidation with the Cleveland Automobile Co., under negotiation for some time past, has been declared effective. More than 220,000 of the 280,000 shares of Chandler stock, and more than 235,000 of the 280,000 Cleveland common shares have been deposited. The period for depositing stock has been extended from Jan. 21 to Feb. 7.

**Goodyear Tire & Rubber Co. of California**—This company has asked stockholders to approve the issue of $5,000,000 unsecured 5-year notes. The proceeds are to be used to provide additional working capital and to help the company clear up preferred dividend accumulations. Approval of three-fourths of the preferred stockholders and two-thirds of the common holders is necessary to authorize the issue.

**C. G. Spring & Bumper Co.**—The board of directors declared regular dividend of 10 cents quarterly on the common stock at its meeting held recently. In addition to the regular dividend, an extra dividend of 5 cents was declared, payable Feb. 15, to stockholders of record Feb. 8, making the total dividend this quarter 15 cents. Books will be closed on Feb. 8 and opened on Feb. 16.

**Corduroy Tire Co.**—This company made new sales volume and earnings records in 1925. Directors have been re-elected and they have chosen these officers: L. A. Brown, president; Clifton C. Dyer, vice-president; C. S. Dickey, treasurer and general manager; M. J. Goldner, secretary; B. T. Schall, assistant treasurer.

**U. S. Radiator Co.**—Directors of this company have voted to convert 40,000 shares of $100 par value into 200,000 shares of no par value, exchanging on the basis of five shares of the new for one of the old. No change is to be made in the preferred.

**Lee Tire & Rubber Corp.**—This company announces an offering of 85,163 shares of common stock to holders of record Jan. 18 at $12.50 per share, payable on or before Feb. 5.

**Nordyke & Marmon Co.**—This company reports, for the year ended Dec. 31, net earnings in excess of $2,150,000, and gross sales of more than $16,000,000.

# Low Gasoline Price Handicaps Invention

## Petroleum Institute Discusses Car Operation From Fuel-Saving Standpoint

LOS ANGELES, Jan. 28—As long as gasoline continues to sell at the prevailing scale of prices, the public will not demand, and the automotive industry will not create, any important improvements for more economical motor car operation from the fuel consumption standpoint, according to several speakers at the Sixth Annual Convention of the American Petroleum Institute held in Los Angeles. The convention drew an attendance of nearly 1500 leaders of the oil industry from all parts of the country.

At the group meeting, devoted to a study of motor fuel and motor lubrication, it was emphasized that there is an urgent demand for a seasonal change in gasoline specifications in order to correct the difficulty of starting in cold temperatures. Dr. H. C. Dickinson, representing the U. S. Bureau of Standards, presented several interesting exhibits which measured the starting qualities of various gasolines under varying temperatures. These exhibits clearly emphasized the need for seasonal changes in specifications. Besides speaking on the "Effects of Fuel and Engine Design on Starting," Dr. Dickinson read a paper on the "Purchase of Lubricants on a Quality Basis," in which he declared there should be a more dependable and well-defined basis for readily assaying the value of lubricants. W. S. James, of the Associated Oil Co., Los Angeles, spoke to the group on "Testing Gasolines," and A. L. Clayden, of the Sun Oil Co., spoke on "Anti-Knock Gasolines and the High Compression Engine." Mr. Clayden spoke along the lines of his recent article in AUTOMOTIVE INDUSTRIES.

### Paul Shoup Speaks

Paul Shoup, president of the Pacific Oil Co. and vice-president of the Southern Pacific Railway, in addressing the general session of the convention, declared that economy and efficiency in motor car operation will not be promoted until gasoline grows dearer in price.

"When gasoline is fifty cents a gallon throughout the United States," said Mr. Shoup, "and it is not probable it will be in our time, then cars will be moved many miles more to the gallon than at present. The improvements will come in the automobile, in its design, in its weight, and in the engines that move it, but I fear that as long as we have oil throughout the United States at prices so low that the cost of fuel in running an automobile is not much more than incidental, just so long will there be wastefulness in its use."

### What Conservation Means

Referring to the continued supply of oil, Mr. Shoup said:

"Recurrently someone brings up the question of conservation of oil upon the ground that if it is not conserved shortly, within some period of time, ranging from seven to 100 years we will be without, but, as I understand it, conservation means that the individual shall have all the oil that he needs, gasoline, fuel or other products, for a very reasonable price, but that somewhere, somehow, other people are to be deprived of oil for the benefit of years and generations to come. If somebody suggested that we conserve oil by the simple process of limiting the number of automobiles to be manufactured in the United States each year, there would be a roar that could be heard from the Atlantic to the Pacific.

"When the oil is gone, if it ever is, and none of us in our lifetime will be able to answer that question, human intelligence and ingenuity will find substitutes just as it always has found them heretofore when the thing in hand contributing to its welfare disappeared. It is through necessity being the mother of invention that this country has made the greatest progress."

It was announced at the convention that the Universal Oil Products Co. of Chicago, had donated $250,000 to the fund for scientific research in petroleum. The fund was previously created with a donation of a like amount by John D. Rockefeller.

## *FORD'S CANADIAN TIME-PAYMENT PLAN*

**FORD CITY, ONT., Jan. 26—Details are announced of the new Ford plan which has been introduced by the Ford Motor Co. of Canada, Ltd., in conjunction with the Traders Finance Corp., Ltd.**

**Under the new plan, down-payments on the various models and also the monthly payments are the same throughout the Dominion. The down-payments do not vary, regardless of tax, license, insurance, freight and delivery charge.**

**Down-payments and instalments. which are continued until delivered is price met, follow:**

| | Down | Monthly |
|---|---|---|
| Runabout | $175 | $35 |
| Touring | 200 | 35 |
| Coupe | 250 | 40 |
| Tudor | 300 | 45 |
| Fordor | 350 | 50 |

## French Build Large Airplane

PARIS, Jan. 14 (*by mail*)—A report states that the Bernard Aircraft Co. is building a seaplane for commercial use with a carrying capacity of sixteen passengers. This ship, which is to be of cantilever monoplane design, will be equipped with three 400-hp. engines, and it is said that it will be the largest seaplane in the world when finished.

## Triple-A-Specialty Moves

CHICAGO, Jan. 27—The Triple-A-Specialty Co., formerly located at 630 W. Jackson Blvd., has moved into new quarters at 312-16 S. Hamilton Ave. By the change the company tripled its floor space.

The Triple-A-Specialty Co. manufactures a complete line of battery replacement parts, cable leads, battery chargers and other automotive accessories.

# Motor Boat Show Has 120 Exhibits

## Increased Demand for Outboard Engines—President's Cup Race Authorized

NEW YORK, Jan. 25—The growth of standardized and quality production is emphasized at the Second Annual Motor Boat Show being held this week at Grand Central Palace under auspices of the National Association of Engine and Boat Manufacturers. Among the nearly 120 exhibits the expanding popularity of outboard engines is apparent. The Baby Buzz class, for a type of boat using outboard engines, has been formed and will compete in next summer's regatta. The Johnson Motor Co. is showing its big twin super-outboard engine which will be used in these races.

President Coolidge has authorized the presentation of a trophy for speed boat racing, to be known as the President's Cup, to be owned, controlled and raced for by the American Power Boat Association and its affiliated clubs.

### N. Y. Police Dept. a Buyer

Officials in charge of the exhibit of Sterling Viking engines said that the New York Police Department has ordered two of this type for a new superpower police boat.

At the show Walter P. Chrysler bought three Globe engines from Alexander Johnson, and it was revealed that he plans to build a $250,000 boathouse at Great Neck, L. I., for a 90-ft. cruiser.

Among the boat exhibits are Richard F. Hoyt's runabout, Teaser, which raced against the time of the Twentieth Century express down the Hudson last summer; Baby Gar IV; Baby Gar V; 62-ft. Elco cruiser, the largest boat on view, and a cruiser built by the American Car & Foundry Co.

On the ground floor are several marine engine exhibits, including the Hall-Scott, Packard and Speedway in the large class, and the Evenrude and Johnson in the outboard class. On the second floor accessories and models are shown.

## Automobile Tax Decisions

NEW YORK, Jan. 26—M. L. Seidman, tax expert of Seidman & Seidman, certified public accountants, points out that decisions have recently been made by the Sales Tax Unit on two important points concerning the taxes on automobile chassis and parts.

The first covers the situation where a used truck chassis, taken in trade, is repaired by the manufacturer through parts replacement. It is held that the tax does not apply to sale of such chassis, but the new parts used in repairing are taxable on the wholesale price basis.

The other point is that a sale of a chassis manufactured by assembling salvaged parts and new parts is subject to tax on the basis of the price for which it is sold.

# Men of the Industry and What They Are Doing

## Willys-Overland Co. Makes Personnel Changes

Herbert C. Chalmers, formerly retail manager of the Omaha branch of the Willys-Overland, Inc., has been appointed head of the used car sales promotion work at the Toledo, Ohio, factory, it was announced by R. M. Rowland, sales promotion manager.

Mr. Chalmers will assist Willys-Overland dealers in handling used car problems. He is at present gathering data which will be used in an extensive used car campaign.

The appointment of J. D. Duffy to the sales promotion department has been announced. Mr. Duffy comes to the factory after a long experience with the New York branch, both in the wholesale and retail departments.

### Moore on Truck Committee

Paul Moore, of the Garford Motor Truck Co., has been appointed to the motor truck committee of the National Automobile Chamber of Commerce.

Other members of the committee are: Windsor T. White, (White); David C. Fenner, (Mack); M. L. Pulcher, (Federal); David S. Ludlum, (Autocar); O. H. Browning, (International Harvester); and O. E. Stoll, (G. M.).

### A. E. Barlow Resigns

A. E. Barlow has resigned as general manager of Boyce & Veeder Co. and is succeeded by W. Covert Jones, formerly general manager of the same company.

Harrison H. Boyce has disposed of his financial interest in the company, but there has been no change in control.

### Mackie Goes With Flint

R. H. Mulch, vice-president and general sales manager of the Flint Motor Co., announces the appointment of W. H. Mackie as sales promotion manager.

Mr. Mackie is an experienced advertising man and will map out a program of extensive sales helps for the Flint selling organization.

### Kegerreis With Tillotson

C. S. Kegerreis, Toledo, Ohio, for seven years connected with the engineering experiment station at Purdue University, has joined the Tillotson Mfg. Co., to direct the new research department in studying carburetion as it relates to the internal combustion engine.

### Stout a Club President

William B. Stout, founder of the Stout All-Metal Airplane Co., and now in charge of airplane construction for the Ford Motor Co., has been elected president of the Aviation Country Club, Detroit.

**H. J. Leonard**

*Recently elected president of the Stearns Motor Co., Cleveland, Ohio*

### Aeronautic Board Elects

The first $500,000 of the $2,500,000 fund created by Daniel Guggenheim for the promotion of aeronautics was presented this week to the directors of the fund at their first meeting. Harry F. Guggenheim, son of the donor, and a former overseas aviator, was elected president of the board of directors, which is to administer the money in behalf of commercial aviation development. Rear Admiral H. I. Cone, retired, was elected vice-president and treasurer.

After the meeting of directors, Harry F. Guggenheim issued a statement saying the directorate was unanimously in favor of doing as much of its work as possible through existing agencies, in order not to duplicate or overlap the efforts of others in the same field.

In addition to the president and vice-president and treasurer, the directorate includes Dwight W. Morrow, Elihu Root, Jr., F. Trubee Davison, Dr. William F. Durand, General George A. Goethals, Professor A. A. Michelson, John D. Ryan and Orville Wright.

### Maccallum With King-Seeley

James Maccallum, Jr., has joined the King-Seeley Corp., of Ann Arbor, Mich., manufacturer of the K-S Gasoline Telegage, as accessory sales promotion manager. Mr. Maccallum, who formerly was president and general manager of the Gasoscope Co. of St. Louis, will spend some time in Chicago working out a plan of National distribution.

## W. E. Arthur & Co., Inc., Announce Appointments

J. E. Whitbeck, who for the last six years has been superintendent of the eastern division (New York to Chicago), Air Mail Service, will, after Feb. 1, be associated with William E. Arthur & Co., Inc., 103 Park Ave., New York City, specializing in designing and building hangars, preparing flying fields, and installing lighting equipment for night-flying operations.

Mr. Whitbeck has designed and supervised the construction of all the air mail hangars from New York to Iowa City, and supervised the preparation of the flying fields at these places, and fifty emergency fields that are located between New York and Chicago, as well as the lighting of the airway between these points.

Archibald Black becomes identified with the firm as associate engineer, in which capacity he will act as one of the landing-field design engineers. He will continue to operate as an independent engineer on such work as airplane design, appraisals and inspections, in the fields which are not covered by William E. Arthur & Co., Inc.

### Collins Joins Hercules Corp.

W. D. Collins has been appointed assistant engineer at the Hercules Mfg. Co. of Evansville, Ind., manufacturer of stationary engines, truck bodies and the Serv-el Ice Machine.

Mr. Collins has been associated with H. C. Stutz for a long time, and during the last five years was chief engineer for the H. C. S. Cab Mfg. Co. of Indianapolis, Ind.

### Timken Promotes Brower

The Timken Roller Bearing Co., Canton, Ohio, has promoted R. Charles Brower to the position of assistant to H. J. Porter, vice-president in charge of sales. Mr. Brower first became associated with the Timken company in 1916, and at the time of his elevation was assistant general manager.

### Durant Out of Hospital

W. C. Durant, who was injured in a train wreck in Florida week before last, has returned to his home from Roosevelt Hospital and expects to resume business shortly.

While in the hospital he handled considerable of his affairs on the New York Stock Exchange by telephone.

### Darnell Resigns

R. C. Darnell, who for the last ten years has been identified with the Northway Motor & Mfg. Co., later known as the General Motors Truck Co. Engine Plant, has resigned as assistant chief engineer.

# G.M.Stadelman, Head of Goodyear, is Dead

## Demise in His Akron Home Sudden — Joined Tire Concern in 1901

AKRON, Jan. 22—George M. Stadelman, 54, president of the Goodyear Tire and Rubber Co., and first vice-president of the Rubber Association of America, Inc., died suddenly here tonight. He had not been feeling well for several weeks but his family did not believe him to be seriously ill.

A recent robbery at the Stadelman home on West Hill, during which two robbers compelled Mr. and Mrs. Stadelman to assist them, is believed to have aggravated his illness.

**Rose From Position as Clerk**

Mr. Stadelman joined Goodyear in 1901. He entered the tire business in 1894 with Morgan & Wright, of Chicago, manufacturer of bicycle tires. Starting as a clerk, he later became sales manager. He resigned when offered a position with the Goodyear Tire and Rubber Co. His first connection with Goodyear gave him charge of carriage tire sales. He became general sales manager in 1906 and vice-president in 1915. In 1923 he assumed the presidency, succeeding E. G. Wilmer, who was made chairman of the board of directors.

The Rubber Association of America, Inc., at its recent meeting in New York, offered Mr. Stadelman the presidency of that organization but he declined the honor because of poor health. He has been an officer of the association for many years.

Mr. Stadelman was born April 8, 1872, at Winona, Minn., where he spent his boyhood. He was married in Chicago in 1902 to Gertrude Grant. He is survived by his widow, a daughter, Gertrude, and a son, Grant, a student at Yale University.

## Active Lobby Supports Motor Regulation Bill

WASHINGTON, Jan. 27—An active lobby to have interstate automobile and truck transportation regulated by the Interstate Commerce Commission has become evident here as members of Congress are being flooded with literature demanding that the new transportation act include the regulation of automobile competition with the railroads.

Hearings on the bill, known as the Cummins' measure, S. 1734, are now being taken by the Senate Interstate Commerce Committee, of which Senator Cummins was formerly chairman, and which is now presided over by Senator James E. Watson of Indiana.

Various members of the I. C. C. have been heard in the last week on the measure, some of whom condemned and others commended its provisions. The present plan is for the I. C. C. commissioners, to be followed by state commissioners on interstate commerce, these in turn to be followed by representatives of the railroads, and later by representatives of the automobile industry, to testify. It will be three or four weeks yet before the automobile representatives can be heard.

# Canada's Tire Men Lay Sales Plans

TORONTO, Ont., Jan. 27—Canadian manufacturers of tires, copying the U. S. system, have announced a new tire warranty. Under the new system, pneumatic tires are given a 90-day guarantee, and solid tires, 180 days. Abuse of the former system made the change imperative.

Booking prices on automobile tires also have been announced. Present prices are unchanged and are effective until Mar. 31, with delivery at any time up to Apr. 30—terms 2 per cent by May 10, 1926. Prices are guaranteed against decline and a rebate on unsold tire stocks will be allowed retailers.

The formation of an association of Canadian retail dealers in rubber goods and rubber motor accessories is being considered. Dealers from many parts of the Dominion attended a recent meeting at which the project was outlined.

Manufacturers decline to become parties to any agreement that might result in curtailment of their sales and invite competition from American sources.

## Batenburg-Webber Co. Negotiations Completed

CHICAGO, Jan. 27—Negotiations have just been completed between the P. H. Webber Co., Hoopeston, Ill., and P. F. J. Batenburg, Racine, Wis., whereby the former has been granted the sole manufacturing and sole rights of the Bat System of supercharging combustion engines.

The system consists essentially of an intake manifold equipped with the Bat dual rotary hydro-carbon mixer, a device designed to fill more completely and uniformly each cylinder of a multiple-cylinder engine with a homogeneous gaseous mixture.

Four sizes of mixers are available, 1⅜, 1½, 1⅝ and 1¾-in., suitable for engines of 150 to 175, 175 to 225, 225 to 275 and 275 to 325-cu. in. piston displacement. The Webber Co. will make a special manifold for Fords, equipped with Bat dual rotary hydro-carbon mixer, to sell for $7.50.

## Bender Wins Sedan

NEW YORK, Jan. 22—A Ford Tudor sedan has been awarded to William Bender, of Brooklyn, one of several thousand who signed cards during their visit to the Ford show, held at the local Ford headquarters here, during the national show week.

# G.M. Employees Get $11,200,000 Savings

## Corporation Distributes Large Sum in Cash and Common to 8300 Workers

NEW YORK, Jan. 22—General Motors prosperity is reflected in an announcement issued today by the corporation to 8300 of its employees to whom a disbursement of $11,200,000 in cash and common stock is being made.

Since the establishment of the savings fund in 1919, each year a new class has been formed, maturing in five years. During the year, employees make monthly or semi-monthly payments into the fund, not exceeding 10 per cent of their wages and the year's total not to exceed $300. For each dollar thus saved the corporation deposits 50 cents in an investment fund in the subsequent five years. Employees may withdraw their deposits, plus interest, but if they withdraw before the end of the five years they forfeit the money deposited in the investment fund by the corporation.

**May Borrow for Home-Building**

An employee may borrow money to make payment for a home without losing any of the benefits of the plan. Of the 8300 employees in the 1920 class, maturing this year, about 4000 are buying homes in this way. At present about 54 per cent of the 36,000 eligible employees are participating in the plan.

Actual cash distribution now being made to the 8300 employees is $2,043,405, representing their deposits plus 6 per cent interest compounded semi-annually. In addition, the corporation is distributing from the investment fund 75,481 shares of G.M. common, with a market value of $9,157,720.

## Budd Stockholders to Vote on Par Change

PHILADELPHIA, Jan. 28—A special meeting of the stockholders of the E. G. Budd Mfg. Co. has been called for Mar. 17, to vote on a proposal to change the par of the common stock from $100 to no par. The basis of the conversion, it is reported, will be 8 shares of new for each share of the old stock.

## Avery Co. Reorganized

PEORIA, ILL., Jan. 26—A new company, which will be known as the Avery Power Machinery Co., has been organized to take over the business of the former Avery Co. Officials are John W. McDowell, president; George J. Jobst, vice-president; R. J. Boynton, vice-president and general manager; E. R. Bowen, vice-president and secretary, and A. G. Heidrich, treasurer.

Three of the former sizes of Avery tractors, four sizes of threshers, the Avery power road maintainer, and skid motors will be manufactured.

# Coming Events

**SHOWS**

Jan. 30-Feb. 6 — Chicago N.A.C.C. National Annual Show, Coliseum.

Jan. 30-Feb. 6—Chicago, Automobile Salon, Hotel Drake.

Feb. 13-Mar. 15 — International Automobile Show, Copenhagen, Denmark.

**CONVENTIONS**

Feb. 1-3—Chicago, Ninth Annual National Automobile Dealers Association, La Salle Hotel.

Feb. 2-3—Congress Hotel, Chicago, Automotive Electric Service Association.

Feb. 5-6—Chicago, National Battery Makers Association, Hotel Sherman.

April—American Gear Manufacturers Association, Detroit.

**RACE**

June 12-13—Le Mans, France, Whitworth 24-hour stock car race.

## A.S.S.T. in Annual Meeting in Buffalo

BUFFALO, Jan. 25—Four hundred members attended the winter meeting of the American Society for Steel Treating, which was held here last week.

Thursday afternoon the members of the organization inspected the plants here of the Donner Steel Co. and of the Curtiss Aeroplane & Motor Co. Later they gathered to hear a number of speakers, including Albert F. Dohn, president of the Atlas Steel Corp., Dunkirk; W. H. Cutler, metallurgist at the Lackawanna plant of the Bethlehem Steel Co.; Professor W. Z. Irons of the University of Buffalo; Dr. M. L. Hartman, of the Carborundum Co., Niagara Falls; R. M. Bird, recently elected president of the A. S. S. T.; W. H. Eisenman, secretary of the organization, and Arthur Nutt, of the Curtiss Aeroplane & Engine Co.

**Important Papers Read**

"On the Nature of Alloys of Iron and Chromium," was the title of a paper read on Friday by E. C. Bain, of the Union Carbide & Carbon research laboratories.

Dr. Birger Egeberg, formerly of Sweden, but now of the Halcomb Steel Co., read a paper on "Electric Steel Melting from the Metallurgist's Viewpoint." He pointed out the strides being made in Sweden in the production of steel from waterpower electricity.

A new test for steel intended for use in automobile gears was the subject of an address on "Microscopic Examination of Iron and Steel," by J. J. Curran, Henry Souther Engineering Co.

The convention closed Friday night.

## Kleyer Praises Results of Transport Congress

NEW YORK, Jan. 25—Otto Kleyer, representing the Adler Automobile Works at Frankfort-on-the-Main, Germany, issued a statement expressing the hope that the spirit of unity which characterized the Second Motor World Transport Congress held here during show week will in future animate the automobile industries of all countries in the common interest of the "motorization of all peoples," and that "economic peace may lead to a general peace among nations in the interests of the welfare of humanity."

Mr. Kleyer said that the German automobile industry would do its utmost along this line and that the German delegates will disseminate in Germany the valuable suggestions received at the congress.

Mr. Kleyer, during a stay of about three months in this country, will purchase machine tools for the Adler Works.

***Coming Feature Issues of Chilton Class Journal Publications***

**Feb. 4—Motor Age—Chicago Show Number.**

**Feb. 4—Motor World Wholesale—Chicago Show Report.**

**Feb. 18—Automotive Industries—Statistical Issue.**

## Detroit Car Show Sets New Record

DETROIT, Jan. 28—Thirty-nine makes of passenger cars, 13 makes of motor trucks, 4 makes of motor buses, 5 makes of motor boats and 2 airplanes comprise the exhibits at the Silver Anniversary Automobile Show held by the Detroit Automobile Dealers Association at Convention Hall here this week.

Quite an unusual number of live prospects are reported by practically every maker.

No cars are exhibited here that were not shown at the New York show, although the Dodgeson rotary valve "8" is shown with a chassis.

With the exception of the New York and Chicago shows, the Detroit exhibition is said to be the largest ever held in this country. Two hundred thousand sq. ft. of space was used in housing the models.

## Hartnett Summons Safety Conference for March 11

ALBANY, N. Y., Jan. 25—Charles I. Hartnett, State Motor Vehicle Commissioner, has invited 1,000 officials, including seven state motor vehicle commissioners and police and fire representatives of 110 cities, to attend the New York State Safety Conference here Mar. 11-13.

The chief purpose of the conference is to discuss means of reducing motor accidents.

## Constructive Saving of Rubber Advised

AKRON, OHIO, Jan. 27—A warning to motorists that they should not be misled about the present rubber conservatism agitation was sounded by G. A. Waddle, of counsel for the Goodyear Tire & Rubber Co., who spoke last week before the Cleveland City Club on "The Crude Rubber Situation."

"It would be false economy," he asserted, "for automobile owners suddenly to stop buying tires, and run their old ones past the danger point in order to avoid a rubber shortage. Furthermore, there is no necessity for motorists to inconvenience themselves by curtailing the use of their cars."

**Radical Action Endangers Trade**

Adoption of such measures, Waddle pointed out, would not only react against the tire and motor industries, but against business in general. Constructive, conservative measures include the taking of ordinary care with tires, seeing that they are properly inflated, etc., he said. Repairs should be made wherever warranted.

The rubber situation is rapidly taking care of itself, the speaker declared, and conditions will be further improved by the lifting of restrictions on exports Feb. 1.

## 13th National Foreign Trade Convention Plans

CHARLESTON, S. C., Jan. 28—The program for the Thirteenth National Foreign Trade Convention, which is to be held here April 28, 29 and 30, has just been made public. It includes addresses of welcome by the Mayor of Charleston and the Governor of South Carolina, and a paper on "The Foreign Trade Outlook," by James A. Farrell, chairman of the convention, and president of the U. S. Steel Corp., New York City.

Headquarters for the convention will be in the Francis Marion Hotel.

## Link-Belt Opens Branch

CHICAGO, Jan. 25—The Link-Belt Co., manufacturer of Link-Belt silent chain drives for the transmission of power, announces the opening of a branch office in the First Wisconsin National Bank Bldg., Milwaukee, with R. C. Kendall in charge.